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PAPER TRADE JOURNAL

VOL. 122 NO. 25 JUNE 20, 1946

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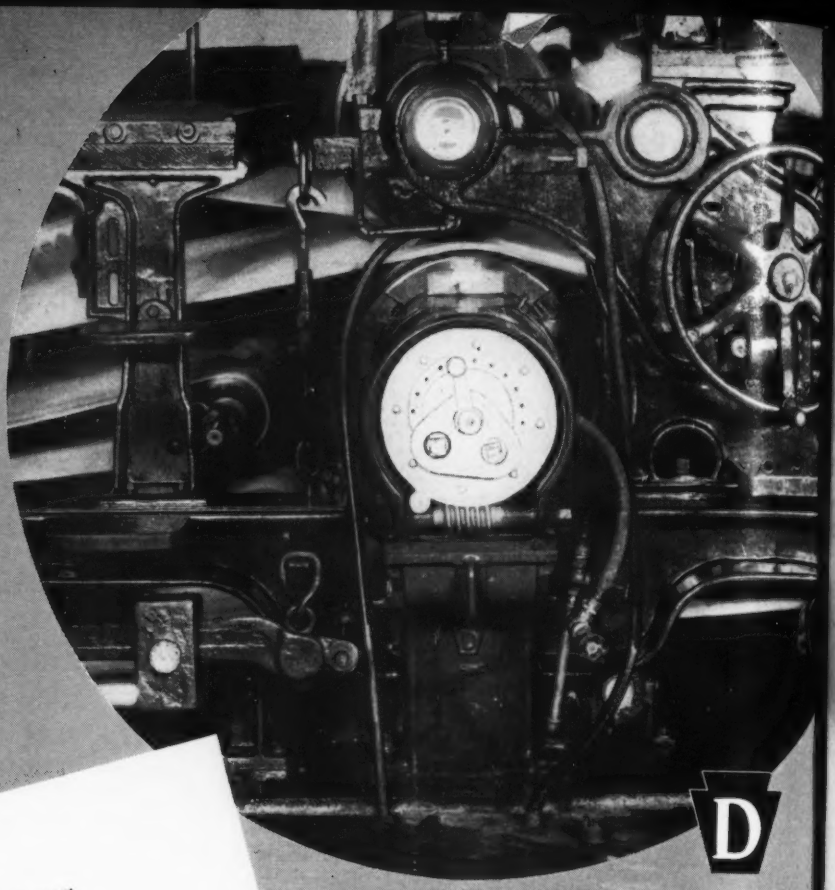
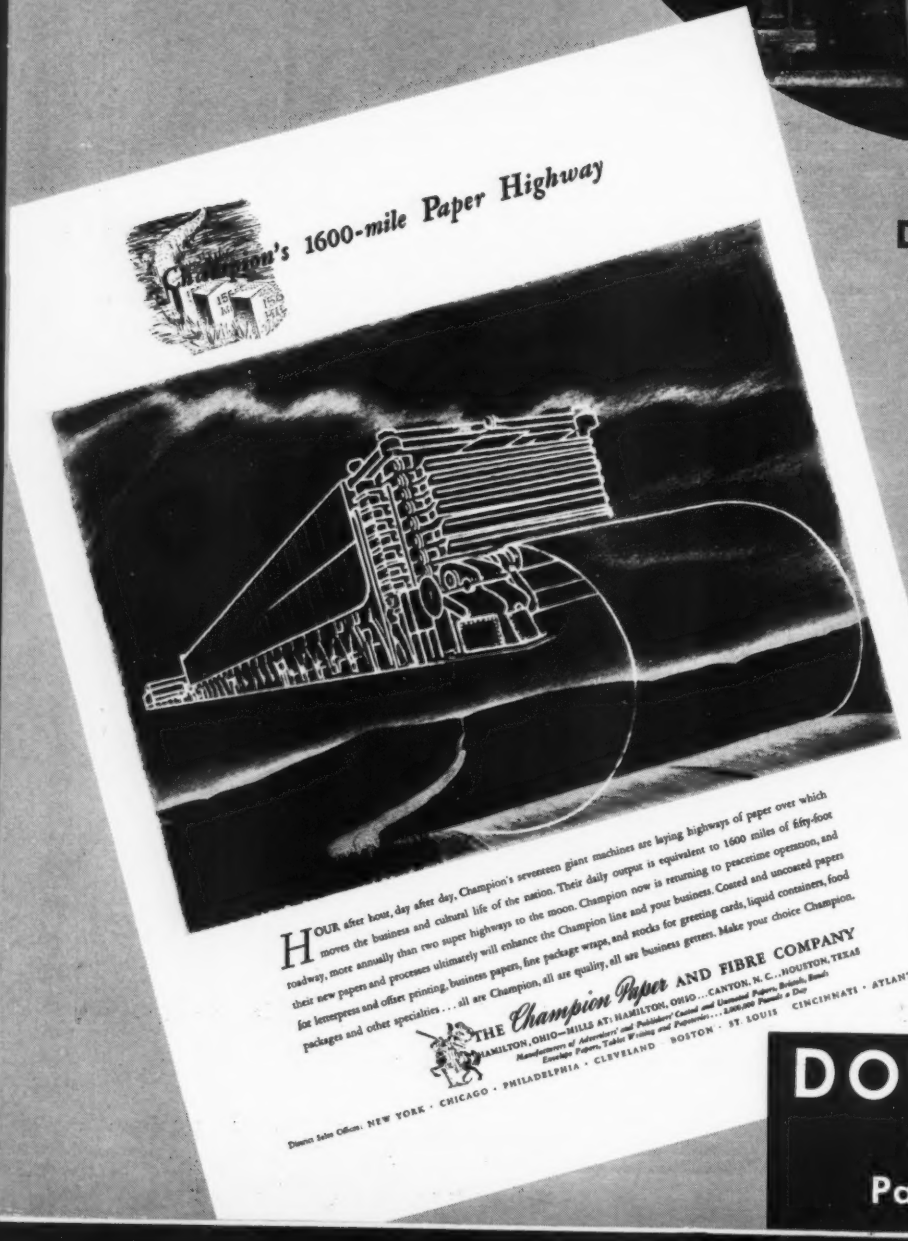
SUPERINTENDENT'S NUMBER

St. Regis Takes Over Florida Paper and Pulp
Congressional Committee Opens Paper Bids
Aries Directs Northeast Wood Council
Superintendents Association Elects Latimer
New England Draws On Its Pulp Inventory
OPA Raises Ceiling on Magazine Papers

DID YOU SEE THE Champion Paper Advertisement IN "FORTUNE" MAGAZINE




Champion's 1600-mile Paper Highway
HOUR after hour, day after day, Champion's seventeen giant machines are laying highways of paper over which moves the business and cultural life of the nation. Their daily output is equivalent to 1600 miles of fifty-foot roadway, more annually than two super highways to the moon. Champion now is returning to peacetime operation, and their new papers and processes ultimately will enhance the Champion line and your business. Coated and uncoated papers for letterpress and offset printing, business papers, fine package wraps, and stocks for greeting cards, liquid containers, food packages and other specialties . . . all are Champion, all are quality, all are business getters. Make your choice Champion.
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HAMILTON, OHIO—MILLS AT: HAMILTON, OHIO . . . CANTON, N. C. . . HOUSTON, TEXAS
Manufacturers of Advertisers' and Publishers' Coated and Uncoated Papers, Boards, Bonds
Envelope Papers, Tablet Writing and Postcards . . . 1,500,000 Pounds a Day
Direct Sales Offices: NEW YORK · CHICAGO · PHILADELPHIA · CLEVELAND · BOSTON · ST. LOUIS · CINCINNATI · ATLANTA

Downingtown Suction Rolls are used on thirteen of the seventeen paper machines mentioned in their advertisement. Of their total daily production, equivalent to 1600 miles of fifty foot roadway, the machines thatare "Downingtown Equipped" account for 75 percent of their daily production, or the equivalent of 1225 miles of fifty foot roadway. . . . Our first order from "Champion" covered 10 Suction Presses, and since that time, they have ordered Downingtown Suction Couch, Suction Press and Suction Felt Rolls.

DOWNINGTOWN MFG. CO.
DOWNINGTOWN, PENNA.

DOWNINGTOW

Designers & Builders
Paper Making Machinery

PAPER TRADE JOURNAL

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Volume 122 Number 25

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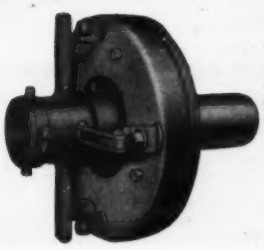

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CONNECT POWER PROPERLY

When you connect with a Kinney clutch you get, at one stroke, dependable, safe and efficient power transmission. The Kinney Interchange Clutch shown picks up Heavy loads smoothly and positively. Rugged and powerful, it transmits power directly through flat discs. Available in solid or split construction for easy installation. The line of Kinney Clutches is complete.

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For assured performance, the valve must suit the service!

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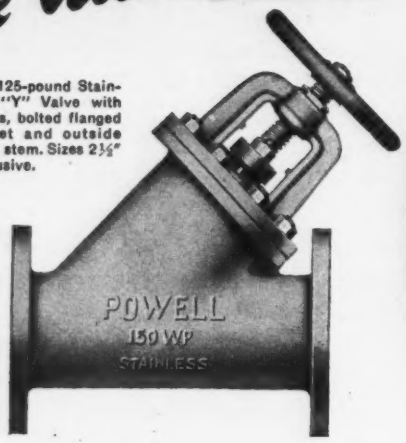
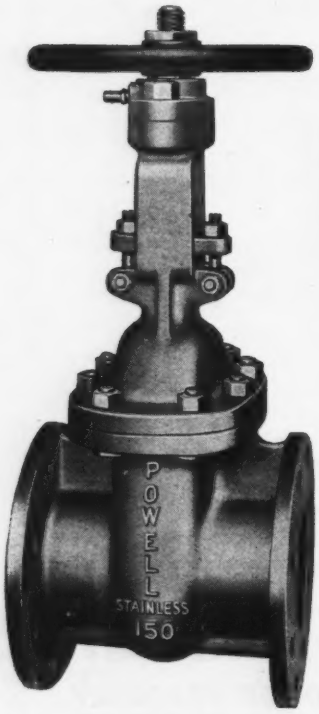
Later, the development of the chemical and process industries imposed new demands; namely, for valves to handle corrosive media. Again Powell blazed the trail and today, in addition to Bronze, Iron and Steel Valves of every required type, size and pressure, Powell offers not only the Cast Steel but also many special designs in the widest range of pure metals and special alloys ever used in making valves.

In short, Powell is prepared to supply the *right* valve for every service in the modern paper mill. Catalogs on request. Kindly specify whether you are interested in Bronze and Iron; Cast Steel; or Corrosion Resistant Valves. If you have any flow control problems, consult Powell Engineering.

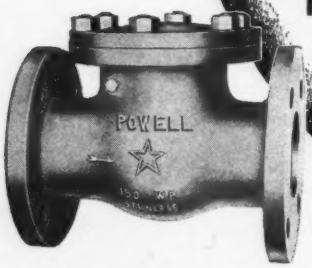
The Wm. Powell Co., Cincinnati 22, Ohio



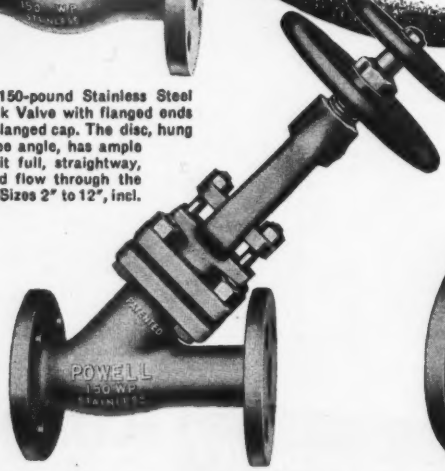
Large size 125-pound Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem. Sizes 2½" to 12", inclusive.



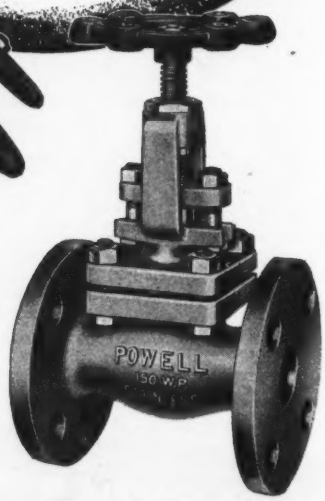
Standard 150-pound Stainless Steel Gate Valve with flanged ends, bolted flanged yoke-bonnet, outside screw rising stem and taper wedge solid disc. Sizes 2½" to 8", inclusive.



Large size 150-pound Stainless Steel Swing Check Valve with flanged ends and bolted flanged cap. The disc, hung on a 5-degree angle, has ample lift to permit full, straightway, unobstructed flow through the valve body. Sizes 2" to 12", incl.



150-pound Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem. Equipped with Powell Patented Seat Wiper, which clears the faces of any corrosion products or adhering materials, thus insuring a tight metal to metal contact between seat and disc. Sizes ¼" to 2", inclusive.



150-pound Stainless Steel Globe Valve with flanged ends, bolted flanged yoke-bonnet, outside screw rising stem and renewable plug type disc. Sizes ¼" to 3", inclusive.

POWELL VALVES

PAPER TRADE JOURNAL
Vol. 122, No. 25 June 20, 1946
Title Reg. U. S. Pat. Off.

Florida Pulp & Paper Sold to St. Regis

NEW YORK CITY — R. K. Ferguson, president of the St. Regis Paper Company, New York, and J. H. Allen, president of the Florida Pulp & Paper Company, Pensacola, this week made known the acquisition by St. Regis of the entire outstanding capital stock of the Florida company from J. H. Allen and associates by the exchange of St. Regis common stock. This transaction marks St. Regis' entry into the kraft pulp and paper industry in the South, its paper-producing properties heretofore having been confined to the Northeast and Pacific Northwest. A new 250-ton kraft paper mill is being built by the Alabama Pulp & Paper Company on a site adjacent to the Pensacola concern, and new multiwall paper bag plant involving a cost of $10,000,000 also will be integrated with the Florida properties.

The Florida company, with 195,000 acres of timberlands, is a completely integrated operation from pulpwood to paper with an annual production of 60,000 tons of bleached and unbleached paper and paper board. The company was organized in 1939 by Mr. Allen and associates, and began operations in August 1941.

The property will continue to be operated under the direction of Mr. Allen, as president. Mr. Allen, one of the promoters and pioneers of kraft paper manufacture in the South, formerly was associated with R. J. Cullen and the Southern Kraft Corp. in the building and operation of a number of southern kraft paper mills. Later he was affiliated with Alexander Calder, president of the Union Bag and Paper Company, in the construction and operation of that company's Savannah mill.

The board of directors of the Florida company will be expanded to include certain directors of St. Regis, and Mr. Allen and an associate will become directors of St. Regis.

The new kraft paper mill of the Alabama company, with a potential daily output of 250 tons, is expected to be in operation by December 1947. The plant is specially designed and equipped for manufacture of heavy duty multiwall bag paper which will be sold to St. Regis.

Besides the acquisition of the Florida company, St. Regis will participate in the financing of the new kraft paper mill and multiwall bag plant and will also have an equity in Alabama Pulp & Paper Co.

Superintendents Elect Latimer At Rousing Annual Meeting

HOMER H. LATIMER
President, American Pulp and Paper Mill Superintendents Association

POLAND SPRING, Maine—To an overflowing attendance and a program that bulged over three full days at both ends and really filled most of five, the American Pulp and Paper Mill Superintendents Association started another new year fully sold on the benefit of conventions. Professional papers of a high order and on varied subjects filled the formal sessions. Golf, horseshoe pitching, baseball, and a wide list of spontaneous games—some of them not even thought of until good fellows got together — filled in the interludes. Homer H. Latimer, of Champion Paper and Fibre was advanced to be president, amid a warm tribute to retiring President R. L. Barton for his accomplishment of the past year. George W. Craigie was again selected as secretary-treasurer of the Association.

With an attendance that crowded up toward the thousand mark and a vast amount of enthusiasm evident in all those present, the 27th annual convention of the American Pulp and Paper Mill Superintendents Association was launched on its four-day course on Monday. On the previous day registration preliminaries had been disposed of for those who came early to be sure of being on time at the opening. On Sunday evening the affiliate members had gathered for dinner, and for a viewing of a motion picture presented by W. L. Glass of F. C. Huyck & Sons. At this dinner also ten new members were welcomed into the group. They are: Ralph Kumler, American Cyanamid & Chemical Corp.; Morris D. Van Patten, Wm. E. Hooper & Sons Co.; Olney Steffins, Penick & Ford, Ltd., Inc., Ivar Ekholm, National Aniline Div., Allied Chemical & Dye Corp.; G. A. Peterson, Rice Barton Corporation; Foster P. Doane, Jr., Sandy Mill Iron & Brass Works; Charles Muzzy, E. D. Jones & Sons Co.; A. L. Hamm, Combustion Engineering Co.; J. G. Bucuss, Acme Steel Co.; H. O. Ehrisman, Foxboro Company.

At the opening session on Monday a brief business session gave opportunity for the presentation of President R. L. Barton's annual report, and for the presentation of a memorial to the late Charles Champion, Past National President of the Superintendents Associa-

(Continued on page 44)

International Buys Plant Of Scharff-Koken

NEW YORK, N. Y.—John H. Hinman, President of International Paper Company, this week disclosed that the company had purchased the assets and goodwill of the Scharff-Koken Manufacturing Company which for many years has been engaged in the manufacture of shipping containers at St. Louis, Mo. Its plant, which has a capacity of about 30,000 tons of containers per year, will supplement the present shipping container operations of International.

International proposes to operate the plant after July 1, 1946,

Neenah Addition Ready For Use Next Month

NEENAH, Wis.—The $90,000 four-story addition to the Neenah Paper Company is expected to be ready for occupancy by the first of next month. Partitions are being placed in the building now for the shipping office and time clock room. The tunnel from the new addition to the main building, as well as the loading platform construction, were started last week.

Newsprint On Hand At 32 Days Supply

Daily newspapers reporting to the American Newspaper Publishers Association show that stocks of newsprint paper on hand were 32 days supply at the end of May 1946 which is an increase of two days supply compared with stocks on hand at the end of April 1946. This 32 days supply at the end of May 1946 compares with 43 days at the end of May 1945; 51 days at the end of May 1944; 50 days at the end of May 1943 and 36 days at the end of May 1941. The inventory regulation of the Civilian Production Administration permits a ceiling of 30 days in some states and 50 days in other states. The ANPA figures are an average for the entire country.

Daily newspapers reporting to the ANPA consumed 261,484 tons of newsprint paper in May 1946, compared with 205,797 tons in 1945 and 260,827 tons in 1941. This was an increase in May 1946 over May 1945 of 27.1% and an increase over May 1941 of 0.3%. 1941 was the base year for calculating allowable use by newspapers under former WPB Order L-240 until revoked effective Dec. 31, 1945.

The total estimated newsprint consumption in the United States for May 1946 was 368,287 tons which includes all kinds of uses of newsprint paper. For the first five months of 1946 it was estimated to be 1,735,883 tons. During the first five months of 1946 the reporting newspapers used 1,232,477 tons of newsprint, an increase of 26.8% over the first five months of 1945 and an increase of 0.6% over the first five months of 1941.

U. S. Envelope Places Secrest At Head of Commercial Sales

SPRINGFIELD, Mass. — Russell A. Secrest has been appointed sales manager in charge of all commercial envelope lines of the United States Envelope Company, under the general supervision of Frank H. Sellars, Jr., vice-president in charge of sales. Mr. Secrest started with this company in 1916 and has had varied experience over a period of thirty years. He has been manager of the Central States Envelope Company Division at Indianapolis.

Pulpwood Group Sees Value In Forestry Education

WAUSAU, Wis.—In years to come, farmers will depend more and more on pulpwood and other forest products in their plans for crop diversification, according to a recent statement by the Marathon County Victory Pulpwood Committee. The committee pointed to the current training being given young men and women in such youth organizations as the Future Farmers of America and the 4-H clubs.

ROBERT S. ARIES
Directs work of Northeastern Wood Utilization Council

Northeastern Council Names Robert S. Aries Director

NEW HAVEN, Conn. — Robert S. Aries has been appointed director of The Northeastern Wood Utilization Council. He was formerly field director of the Council, position which will now be filled by Richard J. Banickow, formerly of the Plastics Division of the Glenn L. Martin Company.

In his new position Dr. Aries will coordinate the work of the wood using, pulp and paper, and other companies in the Northeast for the purpose of increasing their production and utilizing by means of chemical conversion, the low grade and non saleable wood available in large quantities.

The headquarters will be as heretofore in New York City.

Wholesalers Volume Rose 16 Per Cent for Four Months

WASHINGTON, D. C. — Wholesalers' sales of paper and paper products in the first four months of the year totaled $29,651,000, according to the Bureau of Census, based on figures of a reporting group, a rise of 16 per cent over the corresponding period of 1945.

April sales totaled $7,879,000, four per cent higher than for March, and 25 per cent above April, 1945, sales. Inventories for April rose 2 per cent from March and 25 per cent above April, 1945, it was stated.

Mead to Expand at Lynchburg

LYNCHBURG, Va. — According to Manager Wistar M. Heald, a $35,000 addition to the Mead Corporation's Lynchburg plant is contemplated as soon as building materials can be obtained. Mr. Heald said the addition will be built from proceeds of a new financing program to be undertaken by the corporation.

New England Mills Drawing on Pulp

HOLYOKE, Mass.—Hopes for an increase in wood pulp supplies in the record-producing fine paper industry are dwindling, beset by labor shortages, housing competition for lumber and light Swedish imports, it is asserted in the trade here.

Some mills are drawing on inventories to help maintain the industry's production pace, which currently is rated at 1,100,000 tons annually, it was said. Output for 1945 was 1,002,000 tons and for 1939, 723,000 tons, it was pointed out.

Inroads into inventories which were accumulated from the substantial arrivals from Sweden last fall are being made particularly at nonintegrated paper mills, those that are dependent upon purchased pulp for their basic raw material, it was explained by Holyoke mill men, who are in that category. In view of the small amount of pulp which has been arriving from Sweden since February, stocks were reported as declining rapidly.

Disappointment is felt in the industry here at the relatively light shipments presently coming forward from Sweden since greater tonnages were anticipated after the OPA raised ceiling prices on wood pulp.

Ross Smith Returns To Nashua Post

NASHUA, N. H. — Ross G. Smith, traffic manager for the Nashua Gummed & Coated Paper Company, has returned, after serving during the war as a 1st Lieutenant in the Army Transportation Corps. He was assigned to duty on transports carrying troops to and from North Africa and Europe, making thirteen round trips in all.

Austin W. Sanborn, who batted for Mr. Smith as traffic manager during the war, has resumed his former duty as a sales representative. He has been assigned to the Philadelphia office of the company, where he will handle the selling of gummed and coated papers. He will devote also some time to their waxed paper and specialty printing products.

Wallpaper Pays First Dividend On New Preferred Stock

CHICAGO — The initial dividend, of 33⅓c per share, on 40,000 shares outstanding of the four percent cumulative convertible preferred stock, issued May 14, was declared today by the Board of Directors of United Wallpaper, Inc., it was announced by William H. Yates, president. The dividend is payable July 15 to stockholders of record at close of business July 1.

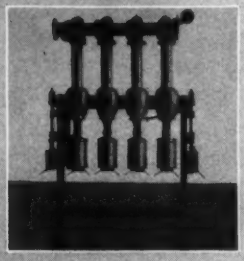
This dividend covers the regular quarterly dividend based on a two month period from May 14, 1946, the date the stock was originally issued, to July 15, 1946.

SUPERINTENDENTS NUMBER

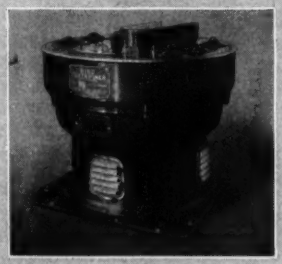
NINE WAYS TO MAKE BETTER PAPER AND MORE OF IT AT LOWER COST

1. **The Bird Screen** has proved itself indispensable for continuous, high speed production of uniformly good paper at lowest screening cost.

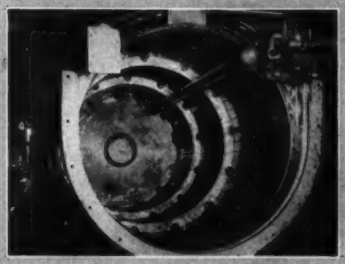
2. **The Jonsson Screen** produces maximum volume of clean, knot-free pulp with minimum loss of stock in the tailings and at lowest operating cost.



3. **The Bird Dirtee** removes heavy and fine paper dirt by the pressure-drop principle with the utmost effectiveness and economy.

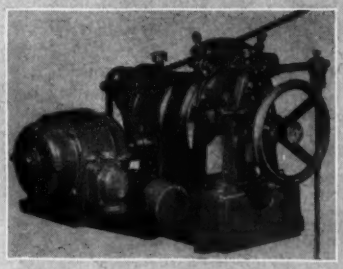


4. **The Bird Centrifiner** produces cleanest paper of fine grades and specialties by triple centrifugal treatment.



5. **The Bird Oscillating Shower Pipe** keeps screen plates continuously clean and open with the minimum amount of shower water thereby improving water control and saving fibre and heat.

6. **The Bird Save-All** recovers good papermaking stock from waste water at lowest net cost per pound of fibre.



7. **The Bird Consistency Regulator** holds stock consistency to within plus or minus 0.1%, performing this important function at lowest over-all cost.

8. **The Vickery Felt Conditioner** increases production by eliminating midweek shutdowns, improves quality and uniformity of paper finish, reduces cost by increasing water removal at the presses.

9. **Vickery Doctors** keep papermaking roll surfaces continuously in shape to turn out top volume of uniformly good paper with minimum cost of roll maintenance.

ARE YOU MAKING THE MOST OF THEM?

If there's any question about it
get in touch with

BIRD MACHINE COMPANY

SOUTH WALPOLE · MASSACHUSETTS

FRED C. BOYCE
Finance Committee, American Pulp and Paper Mill Superintendents Association

WILLIAM H. BRYDGES
Finance Committee, American Pulp and Paper Mill Superintendents Association

KILLEY E. TERRY
Finance Committee, American Pulp and Paper Mill Superintendents Association

Superintendents Elect Latimer

(Continued from page 41)

tion, in the form of a lectern. The presentation was made to President Raymond L. Barton by C. H. Kent, Hercules Powder Company, Holyoke, Mass., on behalf of the large host of friends of Mr. Champion.

At 10:30 the General Conference, opening the business and group meetings, was held with Homer Latimer presiding. Feature of this initial session was a talk by G. H. Petersen on "Problems of the Printer and How the Paper Industry Can Cooperate With Them."

G. R. Schneck, Director Industrial Relations, Riegel Paper Corp., opened the program with a featured paper. His timely topic, "Some Reflections on the Responsibilities of Supervisors in the Field of Labor Relations," was followed by a lively question and answer period.

Luncheon on Monday was held in the Main Dining Room. Toastmaster, Raymond L. Barton, introduced speaker James Ritchie, Assistant Director U. S. Pulp Producer's Association. Mr. Ritchie's subject was "Some National and International Aspects of the Pulp Situation."

The General Conference was resumed after luncheon and was devoted to various group meetings.

The Chemical Pulp session was led by H. E. Karberg and Murray Bennett. A Forum on Pulp Bleaching was presided over by Vernon Woodside.

The Power and Plant Engineers section heard papers on: "Anti-friction Bearing Lubrication on Paper Machines," by Donald T. Alcorn, Socony-Vacuum Oil Company; "Modern Dryer Bearing Lubrication Systems," by E. M. May, Bowser Company, Inc.; and "Possible Applications of the Gas Turbine to the Pulp & Paper Industry," by D. G. A. Skrotzki.

At the board meeting Allen A. Lowe, Sandy Hill Iron & Brass Works, spoke on "New Thonghts on Drives, Screens and Vats for Cylinder Board Machine." He was followed by a paper on "Stock Preparation," presented by Robert Vokes, Dilts Machine Works. "The Benefits of the Board Machine Air System" were expounded by William K. Metcalf, J. O. Ross Engineering Corp.

Tuesday was given over mainly to recreational activity, a program which was declared eminently successful by its participants. There is still some lack of clarity as to the performance of many doughty contestants, but at dinner that night the committee had sufficiently cleared the air to be able to announce some results of record. All-American football player Jim Crowley who presided over this function declared that the superintendents' team had taken the measure of the salesmen at the softball match by a fairly close score: 11-8. At golf J. R. Sintson, of Champion, turned in low gross for the superintendents; David Murchison of Georgia Kaolin was lowest among the salesmen. For the best score on three selected par holes Ray Totten of Ciba was awarded a prize, and O. S. True of United States Rubber was nearest the pin on the sixth hole. From the elite to the democratic prizes were awarded to those who had turned in the most highly standardized scores. Bob Larsen had the most fours; W. S. Yunker had the most fives; George Genaker reported the most sixes; W. E. Close had the most sevens; and G. Butterworth, Jr., had the most eights. But Allie Messner turned in the highest over-all gross.

GEORGE W. CRAIGIE
Secretary-Treasurer, American Pulp and Paper Mill Superintendents Association

At horseshoe pitching Arthur Brossius of the Brown Company carried off honors. At bowling Capt. Arthur Hobday, of Southworth, and Mrs. Allie Messner won prizes for best male and female score. Mrs. Charles Ludwig took honors in the putting contest.

High spot of Wednesday's program was the election of officers. Latimer was elevated from his first vice-presidency to be president. Others similarly advanced were Raymond F. Bennett of Ecusta, Ollie W. Messner of Robertson Paper Box, Charles H. Reese of Nekoosa-Edwards and James Fish of Paterson Paper Parchment who rank as vice-presidents in the order named. Charles E. Ackley of Crown-Zellerbach was elected fifth vice-president.

Tuesday had also presented its own list of group meetings. The Fine Papers group heard papers on: "Possibilities of the New Dandy Roll Drive," by P. S. Sinclair, Sinclair Co., Holyoke, Mass.; "Modern Methods of Stock Preparation"—Speakers: D. G. Sutherland, Sutherland Refiner Corp., Trenton, N. J.; R. F. Vokes, Dilts Machine Works, Fulton, N. Y.; C. W. Morden, Morden Machine Co., Portland, Ore.

Another group interested in woodroom and woods operation heard

- Anti-Friction Bearings
- Fine Control
- Precise Formation

Sandy Hill Paper Making Wet Machine

For the production of high grade electric and insulation boards, stereotype matrix board, binders board, shoe boards, truck board, and leather board to the fine specifications demanded by these and other similar wet machine products.

The paper making vat is designed with carefully calculated inflow compartments, a well designed circle and an adequate overflow. Cylinder mould, rubber covered couch roll and press and felt rolls are carried on anti-friction bearings. Scofield Venturi Suctions for water removal and Scofield Felt Conditioners are provided.

A movable cylinder mould vat is an alternate for the standard paper board vat. With this attachment the cylinder mould may be moved in relation to the circle 3" in any direction from a central setting. This controls the flow of stock through the vat to a finer degree than other devices now offered to the trade.

Precision control of formation and caliper is the basic principle of the design of this machine.

From a Simple Casting to a Paper Machine . . .
Sandy Hill Serves the Industry Completely!

THE SANDY HILL IRON & BRASS WORKS
HUDSON FALLS, N. Y.

RAYMOND F. BENNETT
1st Vice President, American Pulp and Paper Mill Superintendents Association

OLLIE W. MESSNER
2nd Vice President, American Pulp and Paper Mill Superintendents Association

CHARLES H. REESE
3rd Vice President, American Pulp and Paper Mill Superintendents Association

papers on: "Wood Handling & Process Equipment"—J. A. Fritz, Allis-Chalmers Mfg. Co., Milwaukee, Wis. Illustrated with film; "Developments in Portable Log Barkers and Other Wood Preparation Equipment"—C. L. Durkee, D. J. Murray Mfg. Company, Wausau, Wis.; "Portable Log Barker"—Representative, Nekoosa Foundry & Machine Company, Nekoosa, Wis.; "Spare That Tree" (Worthington Hydrobarker)—Motion Picture. Speaker, J. E. Holveck, Worthington Pump & Machinery Corp., Harrison, N. J.; "Machine Knives in Industry"—J. D. McCready, Asst. General Manager, and R. A. Gilchrist, Asst. Supt. Fitchburg Plant—Simmonds Saw & Steel Company, Fitchburg, Mass. With technicolor sound film.

The Tissue section listened to: "The Mildew Proofing of Paper Mill Felts"—F. A. Soderberg, General Dyestuff Corp., New York, N. Y.; "Vortrap Applications and Operation" — F. B. Schilling and Harold E. Ingalls, Nichols Engr. and Research Corp., New York, N. Y.; Motion Picture—"Paper, Pace Maker of Progress" — William Greeley, F. C. Huyck & Sons, Albany, N. Y.

The Coated Paper group had its own program. On Thursday morning it heard: "The Man in the Middle"—Edward A. Jackman, Asst. Personnel Mgr. Oxford Paper Co., Rumford, Me.; "The Converter Needs More than Paper"—Lloyd M. Perry, Chief Chemist, Nashua Gummed & Coated Paper Co. of Nashua, N. H.; "Your Part in Lithography's Future"—Wade E. Griswold, Exec. Director, Lithographic Technical Foundation, New York, N.Y.

The Kraft group listened to: "The Effect of the Pulp and Paper Industry on Southern Forestry"—J. H. Allen, President of Florida Pulp and Paper Company, Pensacola, Fla.; and "Remote Control of Stock Preparation Equipment" — J. W. Couture, Chief Eng., Dilts Machine Works, Fulton, N. Y.

OPA Raises Prices On Magazine Paper

WASHINGTON, D. C. — Manufacturers' ceiling prices for book paper sales to magazine publishers have been increased up to $1 per hundred pounds. The action effective June 17, 1946, carries limiting stipulations that the new ceilings may not be higher than the same manufacturer's spot price to wholesale merchants for the same grade of paper. The limits vary according to volume sold. OPA pointed out that book paper manufacturers have October 1, 1941, to March 31, 1942, to "freeze" ceiling prices. Traditionally, there is a spread between prices quoted magazine publishers and those quoted paper merchants because of the large volume sold magazine publishers as well as the long term contracts provided.

This action is expected to make greater quantities of magazine paper available on contract sales at prices below those now prevailing on spot market sales. Whether the action will result in higher magazine prices is not known, OPA said. This will be entirely up to each magazine publisher, as magazines are not under price control. OPA said that it had discussed the action with its Book Paper Industry Advisory Committee, representing manufacturers, and that generally the committee was in accord with the action.

Hammond Bag Buys New Tube Machine

SOUTH WINDHAM, Conn.—Smith & Winchester Manufacturing Co. has just shipped a tubing machine of latest design including special photoelectric compensating drive for registering printing, for making three-wall cement bags, to Hammond Bag and Paper Company, Wellsburg, W. Va.

Eagle Lodge Confers With Tissue Mills

HOLYOKE, Mass.—A special meeting of Eagle Lodge of Papermakers is to be called to act on counter proposals made to union demands by the management of the American Tissue Mills.

The company offered a wage increase of eight cents an hour, as against 13½ demanded by the union. The eight-cent raise, added to a five-cent increase given last February, would make a total boost of 13 cents this year. The raises of 6 and 7 cents an hour in the other local paper mills last winter, plus the recently granted 8½ cents, means an average raise in those other mills of 15 cents this year, the unions figure.

The American Tissue Mills representatives are reported to have agreed to a union proposal of premium pay of two hours for employes called to work during their off-duty hours. The conferees were far apart on the matter of pay for workless holidays, the company offering one additional holiday for a total of three, while union demands a total of six as was agreed to by the other mills.

Representing the employes were President Andrew Beaton, Secretary William McFadden and International Organizer Edward Moore. For the company were President B. I. Perkins, Treasurer J. Lewis Perkins, Benjamin F. Perkins, 3d, and Atty. Philip O'Brien.

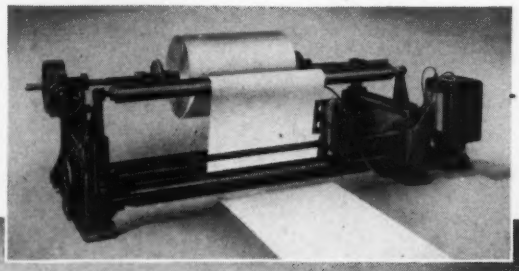
Safety Conference Picks Wausau

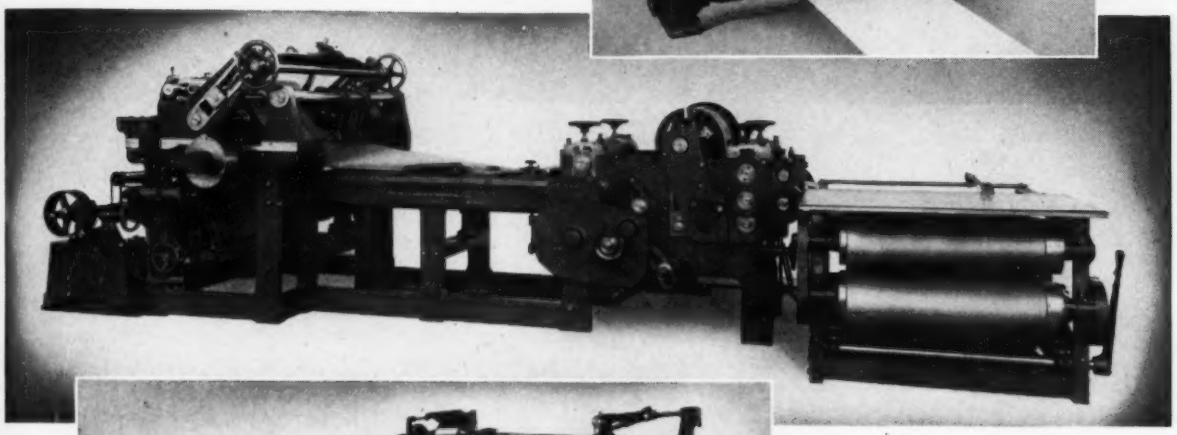
ANTIGO, Wis.—Wausau was selected as the host city for the sixteenth annual Wisconsin Valley Safety Conference in 1947 at this year's annual conference June 13 in this city. The invitation was extended by the Wausau Chamber of Commerce. About 500 persons were present.

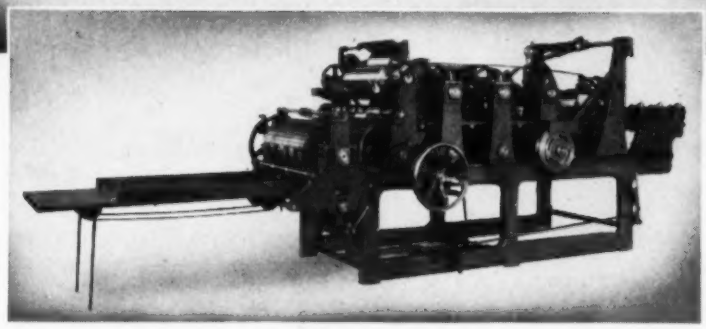
Here's a combination that gives . . .

INCREASED BAG PRODUCTION

LESS PAPER SPOILAGE







TOP

S & W Electric Eye Side Register Control for accurately guiding stock from roll to Tuber.

CENTER

S & W Tuber, for tubes up to 14" wide, 44" long. Side or center seam. Right angle delivery.

BOTTOM

S & W ½ bbl. heavy duty Satchel and Valve Bottomer. Takes tubes up to 28" wide, 60" long.

Smith & Winchester, pioneers in the building of paper bag machinery, have had the experience of many years working with the trade. This close cooperation has resulted in equipment of sound design, extreme rigidity of construction, and many exclusive features for the increased production of high grade bags.

S & W Tubers are designed for pasted or sewed type tubes, of single or multi-wall construction.

S & W Bottomers are built to produce standard satchel and valve bottoms or the combination of the two. Smith & Winchester makes custom-built machines for special requirements.

S

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PAPER BAG
and
PAPER MILL
MACHINERY

1828

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The SMITH & WINCHESTER *Manufacturing Company*

SOUTH WINDHAM, CONN.

SERVING THE PAPER INDUSTRY SINCE 1828

NATIONAL COUNCIL FOR STREAM IMPROVEMENT MEMBERS DISCUSS PAPER INDUSTRY'S POLLUTION PROBLEMS

Members of the National Council for Stream Improvement in the Lake and Central States Regions, at a meeting held at the Drake Hotel in Chicago on June 5, discussed pulp, paper and paperboard industries' stream pollution problems with representatives of state regulatory agencies in the region. John Traquair of Mead Corporation, presided. Russell L. Winget, Executive Secretary of the National Council, reviewed the activities of the Council since it began its active program in June 1944; Dr. Harry W. Gehm, the Council's Technical Advisor, summarized the Council's overall research program; Professor W. W. Hodge of The Mellon Institute of Industrial Research reported on the Institute's activities on deinking mill wastes and acid bleachery wastes; Philip Morgan, Fellow of Mellon Institute, reported on the Council's activities in the Kalamazoo area; Professor Don E. Bloodgood summarized the research at Purdue University in connection with strawboard mills' waste problems; and Dr. Willis Van Horn of the Institute of Paper Chemistry, reviewed the Council's program at the Institute.

Consolidated Offers To Buy Up Farms

WAUSAU, Wis. — Insistence of a group of Portage county farmers that the Wisconsin Valley Improvement Company of this city rebuild and maintain Highway H across the proposed George Mead reservoir in Marathon county greatly diminished at a town meeting June 8 at the Eau Pleine town hall near Junction City. Farmers present agreed to the abandonment of sections of Highways H and O in the township, provided the Consolidated Water Power and Paper Company, Wisconsin Rapids, agrees to buy out farmers desiring to leave the locality if these roads are closed.

The paper company, which initiated the Mead reservoir project as a means of increasing the hydro-electric power on the Wisconsin river south of the Marathon-Portage county line, has agreed to rebuild County Highway H from County Highway O in Portage county to the Portage-Wood county line, at a point 2½ miles south of its present location. The relocated road would be about 4 miles long.

This offer and the company's apparent willingness to buy out farmers desiring to sell have greatly decreased opposition to the flowage development among farmers of that area, it is reported. Robert J. Hunter, Eau Pleine town chairman, who presided at the meeting, estimated that from 25 to 30 farms in the town would be affected by the flowage.

The company's engineers said that continuance of Highway H would be impractical and they estimated that the cost of rebuilding that highway above the level of the flowage would reach $300,000, which would result in abandonment of the reservoir project at this time.

The Portage county board of supervisors is expected to act early in July on abandonment of parts of O and H. Marathon and Wood county boards also have scheduled special sessions early next month to act on similar business.

Waxed Paper Institute Meets Next Week at French Lick

CHICAGO—A report on the progress made by the industrial relations committee of the Waxed Paper Institute, will be made by Peter J. Massey of the H. P. Smith Paper Company at an Institute meeting to be held June 27 and 28 at French Lick Springs, Indiana. The meeting, which will be a special one, is to cover recent pricing adjustments and regulations and the industry-wide promotional program as well as the industrial relations activity which Mr. Massey will cover. Announcement of the meeting was made by A. H. Noelke, secretary-treasurer of the Institute.

CPA Sanctions Addition For Holyoke Card Plant

HOLYOKE, Mass.—The Civilian Production Administration has granted permission to the Holyoke Card & Paper Co., Springfield, of which R. D. W. Ewing of Holyoke is president, to embark on a $109,391 addition. This permit was authorized because the company had ordered new machinery last summer for delivery in mid-1946, and it is now being sent.

OPA's Uncertainties Slow Midwest Trade

CHICAGO — Local paper trade went into the last two weeks of June finding that some of its major sources, including the waste paper trade, were confused over the OPA outlook and were holding up operations to determine what would actually be the outcome of the bitter Congressional fight over OPA controls. In the waste paper trade, in particular, there was reported discomfiture over the refusal of the control agency to recognize the plight of smaller operators who are said to need price ceiling revision badly for a number of reasons.

On the other hand, demand was as heavy as ever and there seemed to be a readiness on all sides to take up the full production of an industry which is even now breaking production records under severe handicaps. The combination of big demand and full scale production continued to excite market investors, syndicates and other forces which seemed to believe that the paper trade was the biggest hope for financial gain to yet appear. Veterans of the paper industry were discounting the situation and were reportedly downright fearful that there would be a big over-building of the industry and a resultant return to the "low price industry" status which has plagued the trade for many years.

All lines of paper were at ceiling during the week. All were expectantly wondering what would happen to price control and there continued to be a preponderant belief that the industry without control, would make a better record for itself than with control.

WOODPULP AGENTS
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Abitibi Publishes Its 1945 Earnings

TORONTO—The annual statement of Abitibi Power and Paper Company for 1945 has just been issued. Profit, before bond services, amounted to $4,666,142, compared with $4,281,055 in the previous year. After making allowances for bond services for the year, plus interest on overdue and unpaid interest on bonds for the year and plus the amount, if any, to be provided by Abitibi to permit the above obligations on bonds to be paid in the equivalent of U. S. funds, a balance was left of $1,841,000, compared with $1,043,739. Aggregate amount of sales was $30,043,739, well up from $28,210,694 in 1944.

Current assets are shown as $30,369,771, compared with $28,221,787 a year ago, and current liabilities appear at $3,475,144, against $3,961,654, leaving net working capital of $26,894,627, against $24,260,133.

The annual statement issued by G. P. Clarkson, receiver and manager, said that giving effect to the re-organization plan for both years, comparative earnings would leave a net income of $2,011,457, or $1.25 a share for 1945 on each of 1,395,272 preferred shares of $20 par value, compared with $1,626,370, or $1.08 per share, the year before.

The report said that as standard profits under the Excess Profits Tax Act had not been determined and other matters, including interest on overdue and unpaid bond interest, were still under consideration by the income tax department it was impracticable at date of report to determine the amount of income and excess profits tax in respect of profits for the six years ended Dec. 31, 1945. Payments of $4,801,718 were made up to the end of the year and further amounts aggregating $1,698,281 had been provided as reserve in respect of such taxes.

Great Lakes Shareholders Approve Revision Plans

TORONTO—Common shareholders of Great Lakes Paper Company approved the plan to eliminate the preferred arrears and revise dividend provisions on the "A" and "B" preference shares. All classes of shareholders have now approved the arrangement. "We can reasonably anticipate dividends on the common in the not too distant future," Earle Rowe, president, stated. He intimated that there will be earnings on the common shares this year, but would not indicate what amount could be paid in the form of dividends.

Refunding of first mortgage bonds is being arranged. The terms are not yet settled, but a considerable saving in interest charges will result. The bonds will not be a short-term redemption issue. The company is operating today at 100 percent of capacity, which is 120,000 tons per annum. Net profit for the first four months was about $200,700, and the balance of the year will likely showbetter returns. This profit ratio is about double that of the previous eight months.

Sutherland Paper Offers 57,400 Common Shares

A new issue of 57,400 shares of $10 par value common stock of Sutherland Paper Company was offered to stockholders last week for subscription at $40 a share on the basis of one new share for each five shares held. Stock unsubscribed after June 26 will be underwritten by a group headed by Harris, Hall and Company, Inc.

Container Corporation Files Registration of New Shares

Container Corporation of America last week filed a registration statement with the Securities and Exchange Commission covering the sale of 141,496 shares of capital stock. It is proposed to sell these additional shares through the issuance of rights to Container stockholders of record as of the effective date of the Registration Statement on the basis of one new share for each six shares held. An underwriting group headed by Kidder, Peabody & Company has been formed to underwrite the issue.

Container Corporation of America has outstanding at the present time 848,976 shares of $20 par value capital stock. Upon the successful completion of this proposed issue, the outstanding shares will total 990,472. The proceeds to be received have not been allocated to a specific purpose but will be added initially to the working capital of the Company for its use and the use of its subsidiaries for additions and improvements to its manufacturing and fabricating plants.

Puget Sound Directors Vote Dividends

At a meeting held June 12, 1946, directors of Puget Sound Pulp & Timber Company declared the regular quarterly dividend of 30 cents a share on the preferred stock, payable July 1st to stockholders of record June 15, 1946, and a dividend of 25 cents a share on the common stock, payable June 29 to stockholders of record June 22, 1946. Including this payment, dividends on the common stock paid or declared thus far in 1946, amount to 50 cents a share. Dividends totaling $1 a share were paid on the common stock in 1945.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending June 15, 1946

STOCKS

	High	Low	Last
A. P. W.	9	8½	9
Armstrong Cork Co.	62¾	60½	62⅜
Celotex Corp.	36⅛	35¼	35⅞
Celotex Corp., pf.	22	21⅜	22
Certain-Teed Products Corp.	25¾	23½	25
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.,	61¾	59	61
Champion Paper & Fibre Co., pf.	112½	111	111
Congoleum Nairn Co.	38¾	37¼	38
Container Corp. of America	54½	52⅝	53⅛
Continental-Diamond Fibre Co.	15¾	14½	15¼
Crown-Zellerbach Co.	37¾	36¼	37¼
Crown-Zellerbach Co., pf.	109	108	108⅛
Dixie Cup Co.	50	49⅜	50
Dixie Cup Co.-A	62¾	62	62
Flintkote Co.	46¼	44	44
Flintkote Co., pf.	113¾	113	113
Robert Gair	11¼	10¾	11
Robert Gair, pf.	21	20⅞	20⅞
International Paper Co.	48½	46¾	48¼
International Paper Co., pf.	120	116¾	119
Johns-Manville Corp.	159½	157	158
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	69⅞	68½	68½
Mac Andrews & Forbes	42½	41¼	42
Mac Andrews & Forbes, pf.	160	160	160
Masonite Corp.	70¼	68¾	69¾
Mead Corp.	28⅜	26	26¼
Mead Corp., pf. A-6%	105¾	105¾	105¾
Mead Corp., pf. B-5½%	106⅜	106¼	106⅜
National Container Corp.	36	35	35¼
Paraffine Companies, Inc.	86	85	86
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	30¾	28¾	29⅜
Rayonier, Inc., pf.	38¼	37½	38
Ruberoid Co.	61	59	59
Scott Paper Co.	59	58	59
Scott Paper Co., pf.	110	110	110
Sutherland Paper Co.	51½	45½	45½
Union Bag & Paper Corp.	37½	36	37⅜
United Paperboard Co.	13⅛	12½	12½
U. S. Gypsum Co.	128¾	126	128
U. S. Gypsum Co., pf.	202	202	202
West Virginia Pulp & Paper Co.	53¼	51½	52¾
West Virginia Pulp & Paper Co., pf.	114¼	113	113

BONDS

Abitibi Pulp & Paper Co. 5's '53	112⅝	112	112
Celotex Corp. 3¾s '55	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	....	....	....
International Paper Co. 5s '47	101½	101¼	101¼
Mead Corp. 3½s '53	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending June 15, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	41	40⅝	40⅝
Hummel-Ross Fibre Corp.	20¼	19⅛	19⅛
St. Regis Paper Co.	15	14¼	14⅞
St. Regis Paper Co., pf.	....	....	....
Taggart Corp.	11½	10½	11

BONDS

American Writing Paper Co. 6s '61	102⅞	102¾	102¾

make

APPLETON FELTS

good paper

Appleton Woolen Mills

APPLETON • WISCONSIN

Canadian Wallpaper Profits Rose in Year Just Past

Canadian Wallpaper Manufacturers, Ltd., and subsidiary companies' consolidated balance sheet for the year ended April 30, 1946, shows current assets as $1,334,493 compared with $1,364,767 for the previous year, and current liabilities as $673,399 compared with $403,466 last year.

Net profits for the year is reported as $185,073, compared with $132,841 last year. "During the year we have been unable to satisfy the unprecedented demand for our product. Token shipments to overseas markets have been maintained, but in keeping with our usual policy, prior consideration has been extended to the requirements of the domestic market," President Arnold Ashton states in the annual report.

NAM Urges Science Foundation

WASHINGTON, D. C.—Creation of a National Science Foundation to procure full development of this country's scientific and technical resources along line recommended by Dr. Vannevar Bush, Director of the Office of Scientific Research and Development, is favored by the National Association of Manufacturers, George E. Folk, Special Advisor to the NAM's Committee on Patents and Research, declared Mr. Folk.

American Can Starts Output Of New Frozen Food Package

Production of American Can Company's new frozen food container began this month, making possible high-speed filling and closing for the first time in the frozen food industry.

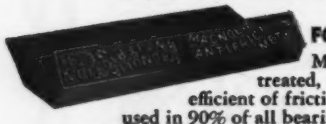
More than 50,000,000 of the new containers will roll off manufacturing lines in three plants during the remainder of the year, Mr. Stolk said, despite the difficulties that were faced in providing the extensive new equipment such initial production requires. Initial production began at the company's plants in Jersey City, N. J., and Seattle, Wash., with manufacture of the containers to start in August at the company's Sacramento, Calif., plant.

Sorg Pays Dividends On Preferred Shares

MIDDLETOWN, Ohio—A cash dividend of $1.50 a share on Series A Preferred Stock and $1 a share on Series B Preferred Stock was declared June 11 by directors of the Sorg Paper Company. The dividends were ordered payable July 1 to stockholders of record June 15 at a meeting of the Executive Committee of the Board of Directors. Dividends are being paid on account of cumulative payments, the company's statement explained.

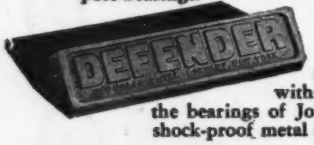
60 YEARS OF PROVEN PERFORMANCE!

Continued research, production and development of bearing metals and base alloys since 1886 qualify Magnolia Metal Company to recommend the right bearing metal for each application. These popular examples are well known to Magnolia dealers in your industry.



FOR SPEED AND UNIFORM LOADS:

MAGNOLIA Anti-Friction Metal, a graphite treated, self-lubricating alloy, has the lowest coefficient of friction of any known bearing metal. It is widely used in 90% of all bearing operations where steady, high speeds and uniform loads prevail. Typical examples are in line shafting, roll bearings, conveyor bearings, electric motors above 10 H.P. and general purpose bearings.



FOR SHOCK LOADS:

Defender Bearing Metal is carefully alloyed for malleability, strength and toughness to withstand heavy shock loads. Continuously used in the bearings of Jordan heaters, pumps and steam engines, this shock-proof metal assures excellent service.

FOR CONSTANT HEAVY LOADS:

Pyramid Bearing Metal has given veteran performance under high heat and heavy load conditions. Characteristic of its resistant capacities under severe service is its continued use in calender stacks, and larger electric motors.

More than 100 uses of Magnolia Bearing Metals are outlined and illustrated in our 8 page bulletin. Write for your copy today.

MAGNOLIA METAL COMPANY, 18 W. Jersey St., Elizabeth 4, N. J.

"Look for the flower brand"

MM-101

MAGNOLIA BEARING METALS

New Eddy Issues Over Subscribed

TORONTO—Public participation in another formerly privately owned enterprise occurred last week when the bonds of the integrated pulp and paper organization of the old established E. E. Eddy Company and Class A stock of a newly-formed investment and holding company were offered by Wood, Gundy & Co. and quickly oversubscribed, it is reported.

The new investment and holding company, Eddy Paper Company, Hull, Que., was incorporated June 1, 1946, and on completion of the financing will own all the outstanding company shares of E. B. Eddy Company. The cost of these shares will be $7,975,000, of which $5,981,250 will be paid to Wittington, Ltd. (all the outstanding share capital of which is owned by W. Garfield Weston) and $1,993,750 to E. W. Bickle, Toronto financier.

The operating company, E. B. Eddy Company, incorporated in 1886, operates pulp and paper enterprises with plants at Hull, Que., and Ottawa, Ont., on opposite sides of the Ottawa River, producing a wide range of products, including specialty and hanging papers, tissue products, paper bags, newsprint and paper board. It employs over 2,000 people and its products are distributed throughout Canada, the United States and overseas markets.

At the beginning of 1945 E. B. Eddy Co. leased the plant of J. R. Booth Ltd. (of whose capital W. Garfield Weston owns 75%) which is the above-named Ottawa plant, and now proposes to purchase the assets of that company (excluding leases of crown lands and water rights) for $5,389,777 cash.

An issue of $4 millions 3½% first mortgage sinking fund series A bonds, due June 15, 1966, was offered by Wood, Gundy & Co. at $100 and accrued interest to supply part of the funds required for the J. R. Booth purchase. The balance is to be supplied from the general funds of the company.

Funds for the purchase of all the outstanding common shares of E. B. Eddy Co. by the newly-formed Eddy Paper Co. are being obtained in part from the sale to the public of 200,000 cumulative convertible non-callable Class A shares, par $20, of Eddy Paper Co., which are offered at $22 a share by Wood, Gundy. The balance will come from the sale of 200,000 no par value common shares of Eddy Paper Co. (all the outstanding common) to J. R. Booth, Ltd. for $4 millions.

Directors of the Eddy Paper Co. are: W. Garfield Weston, chairman of the board, Caulfield, B. C.; G. Gordon Gale, president; W. S. Kidd, vice-president and general manager; and G. C. Winlow, all of Ottawa; John F. Taylor, vice-president, Hull, Que.; H. J. Coon, comptroller, and R. A. Robertson, of Toronto, Ont.

Worthy Mill Grants Increase in Pay

SPRINGFIELD, Mass. — The Worthy Paper company of Agawam has granted a wage increase of 8½ cents an hour to its 70 employes. The increase, which was made effective on the 3d, followed the pattern of that granted by Holyoke paper mills in their new contract with the International Brotherhood of Papermakers, AFL.

Negotiations for other benefits are now in progress between the management and the Worthy local of the union, it was said.

The increase brings to approximately 17½ cents the total advances in hourly wage rates granted by the company since V-J day. Worthy grants its employes whatever wage increases are granted to the workers in the Holyoke mills.

The Worthy mill, widely known for its high grade papers, was sold early this year to the National Printing Company of Thompsonville, Conn., by Gorham Bliss, president, after an election order by the National Labor Relations Board resulted in the AFL union becoming bargaining agent by a margin of one vote. Bliss, whose family had owned it for generations, said that he believed unionization incompatible with the relations which had prevailed between employer and employe.

Albany Committee Favors Proposed Paper Mill

ALBANY, Ga. — Members of committees representing several civic groups, who have just returned to Albany from trips to five cities where paper mills are located, indicated that they were in favor of the establishment of a paper plant in the vicinity of Albany. The committee members visited Mobile and Tuscaloosa, Ala., Monroe, La., Moss Point, Miss., and Charleston, S. C. All reports showed that the mills were utilizing the sulphate process, modern odor controls, and that odors were prevalent only on rare occasions, such as foggy weather.

The committee were sent to investigate the paper mills following discussion in Albany as to whether such a mill might be located in this section.

Casein Output Climbs in April

WASHINGTON, D. C.—Domestic dry casein production for April doubled the March output, for a total of 1,510,000 pounds, according to announcement of the Department of Agriculture. Manufacturers held 3,850,000 pounds in warehouse at the close of the month. April production was reported only 3 per cent less than in April 1945, compared with March production which was 26 per cent under the output of the same month a year earlier.

Consolidated Names Krapfel To Succeed Schnabel

WISCONSIN RAPIDS, Wis.—Two executive changes were announced June 12 by Consolidated Water Power and Paper Company as the result of the recent retirement of John E. Schnabel as general purchasing agent.

Vinson Krapfel has been named to succeed Mr. Schnabel, and B. J. Heger has been named as his assistant. Mr. Krapfel has been with the company for about three years, coming to Wisconsin Rapids from Madison, where he had been in the wholesale lumber business for ten years. He attended the University of Wisconsin.

Mr. Heger has been in with the company for 25 years. Previously he had been employed by the Soo Line and the Chicago and North Western railroads. He has lived in Wisconsin Rapids for 36 years, with the exception of five years which were spent in Port Arthur, Canada, with the Canadian division of Consolidated.

Purchasing is done at the home office for five paper and pulp mills in Wisconsin Rapids, Biron, Appleton and Stevens Point, for Ahdawagam Paper Products Company and Plastics division, Ashland division, Newago Timber Company, Port Arthur, and logging operations in Minnesota, Wisconsin and Michigan.

Wisconsin Mill Employment Holds at Steady Rate

MADISON, Wis. — Employment in Wisconsin's paper and paper products industries was unchanged in April as compared with March, according to the Industrial Commission of Wisconsin, but payrolls showed a slight increase. The total number employed was reported at 25,700 persons.

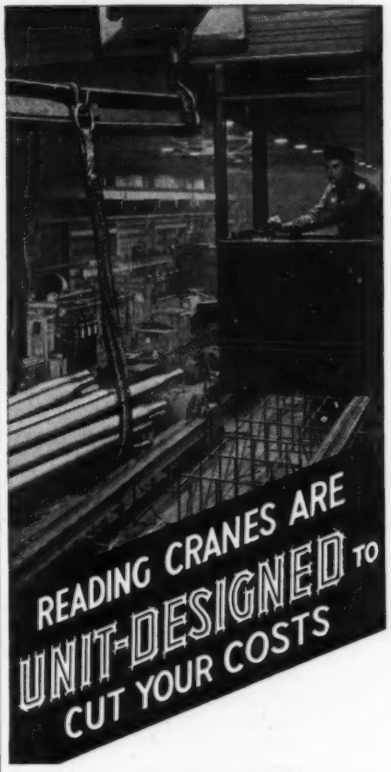
Weekly payrolls were up 0.3 percent in April over March, the figures being $1,091,000 and $1,087,000. Average weekly earnings totaled $42.45 for 44.8 hours, the average hourly rate being 94.7 cents.

With 22 paper and allied products mills reporting in Milwaukee county, April employment was down 0.1%. There were 2,385 employes. The total weekly payrolls of $101,380 represented an increase of 2.9% compared with March. Average weekly earnings amounted to $42.51 for 45.6 hours, or 93.1 cents per hour.

Smith Paper Closes For Vacations

LEE, Mass.—Walter F. Tatun, vice-president and general manager of the mills of Smith Paper, Inc., has announced that the mills will close for a two-week vacation this year. They will shut down at 7 a.m. Sunday June 30 and will reopen at 7 a.m. Monday, July 15.

Effective June 17 Smith office workers will go on a summer schedule. Hours will be from 8 to 12 and from 1 to 4:15.



When you have a READING CRANE installed in your plant, you get a crane CUSTOM-BUILT to meet your specific materials handling operation—at no added engineering cost!

Known as UNIT DESIGN, this unique method of crane construction reduces your costs in 2 ways.

1. LOWERS FIRST COST — Because READING CRANES offer you a choice of several interchangeable motor, control and hoisting units, you buy no "extras" to solve special handling problems.

2. REDUCES MAINTENANCE COSTS —All of the operating parts in a READING CRANE are easily accessible for overhaul or repair. The UNIT DESIGN feature makes it possible to remove any one unit without expensive "breaking down" of other units.

See your distributor for information on how you can get a READING CRANE "tailor made" to your own specifications. Drop us a line for your free copy of "The Why and How of Faster Production."

READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.

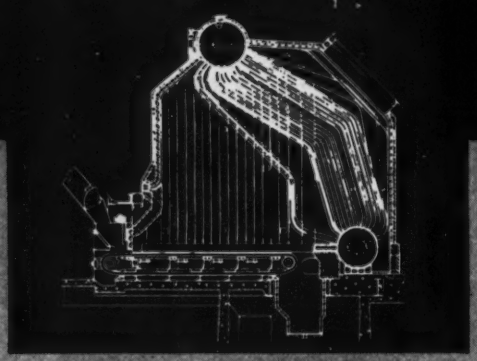
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

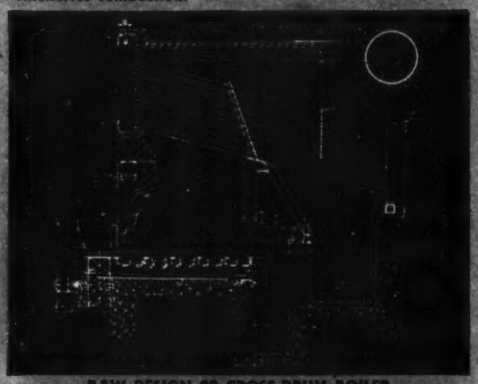
Use B&W BOILERS for LOW COST STEAM

ANY CAPACITY • ANY PRESSURE
ANY TEMPERATURE
ANY SPACE • ANY FUEL

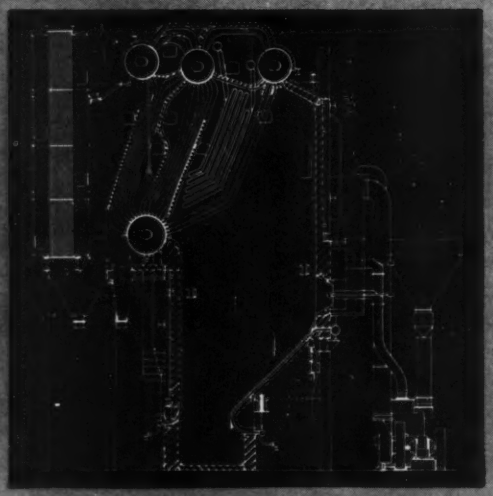
Highest standards of performance with respect to continuity of service, dependability, over-all operating efficiency, and greatest return on investment, are assured when any job of supplying steam requirements is entrusted to B&W Boilers. From the wide variety of time-tested, performance-proved B&W boiler designs, you can always be sure of getting units having the features necessary to provide economical steam generation under any combination of capacity, pressure, temperature, fuel and space requirements encountered in modern boiler installations. When you call on B&W for boilers, you call on a background of over 60 years' unsurpassed experience in designing, building steam generating equipment having a long record of highly satisfactory service wherever steam is used.



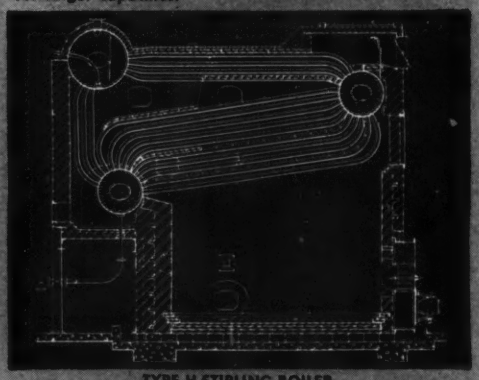
B&W INTEGRAL-FURNACE BOILER (CLASSES 9, 12, & 15)
This Integral-Furnace Boiler is available for firing with stokers or with oil, and in sizes ranging from 1353 to 6506 sq. ft. of heating surface. Having a water-cooled furnace of special design, this boiler provides the dependability of central-station boilers, with efficient and smokeless combustion.



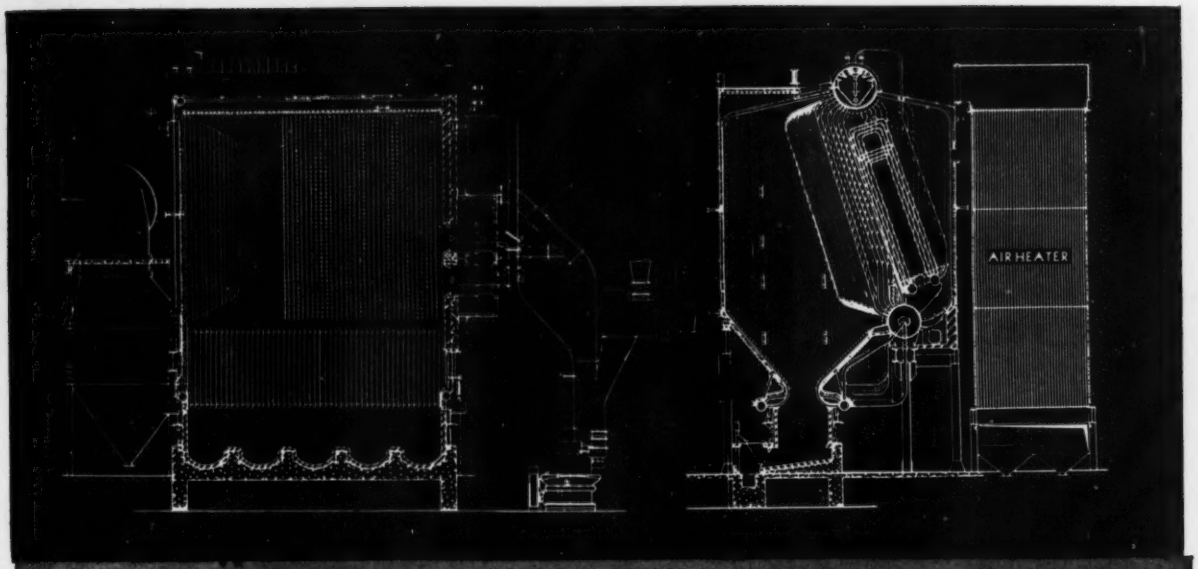
B&W DESIGN 32 CROSS-DRUM BOILER
This unit is widely used in small and medium-size power plants where refractory furnaces are suitable. It provides the advantages of the straight-tube, sectional-header construction used in B&W Cross-Drum Boilers designed for larger capacities.



STIRLING BOILER
The Stirling Boiler fully meets the requirements of modern operating conditions. It readily responds to sudden and heavy demands for steam, and delivers dry steam at relatively high ratings when operated with water having a high concentration of solids. May be fired with any fuel.

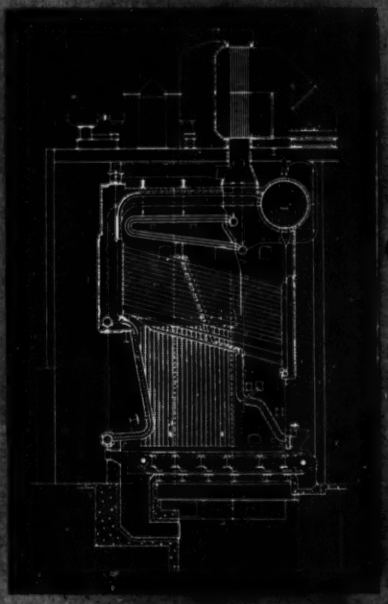


TYPE H STIRLING BOILER
A low-head moderate-pressure unit that is widely used in small industrial plants, institutions, hotels, office buildings and to meet other similar requirements. Available in capacities ranging from 1500 to 30,000 lb. steam per hr. and for firing with any fuel. The furnace, usually of refractory, provides the necessary degree of dependability.



INTEGRAL-FURNACE BOILER

The Integral-Furnace Boiler is a completely co-ordinated unit built in wide range of steam capacities and for pressures and temperatures required by the most up-to-date and efficient prime movers. It is designed to burn pulverized solid fuels, oil, or gas, singly or in combination, thus utilizing at high combustion efficiency the least expensive fuel obtainable in any locality.

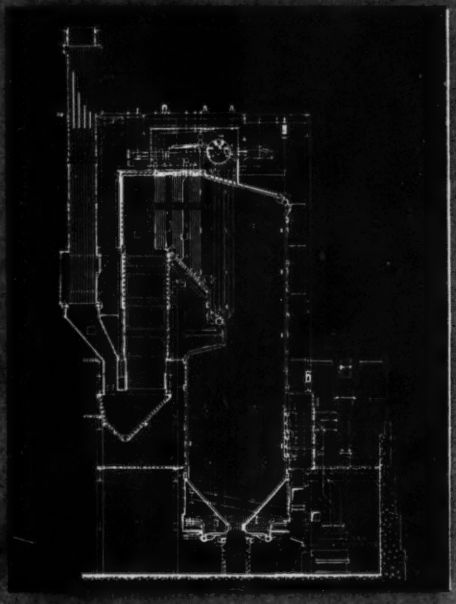


B&W CROSS-DRUM BOILER

This straight-tube sectional-header boiler is noted for its dependability, long life, and ability to deliver dry steam at high ratings. Can be readily inspected and cleaned.

CENTRAL-STATION BOILERS

High-duty boilers for central-station service are available in several basic designs to meet the requirements of individual stations. The Radiant boiler unit illustrated is typical of some of the units now operating at high rates in utility plants.



B&W

Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
85 LIBERTY STREET, NEW YORK 6, N.Y.

G-315T

Congressional Committee Receives Paper Bids

WASHINGTON, D. C.—Bids were received on Monday of this week by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for the three-months period beginning July 1st. The Committee will meet June 24th to consider awards. The bids received today were as follows:

Newsprint

No. 2—370,000 lbs., 24x36—45; rolls, 28, 38 and 48 ins. wide (3-inch fiber cores. Weight of cores and wrappers shall be included in net weight).

Machine-Finish Book

No. 3—200,000 lbs., 25x38—70; flat, cut any size, min. 21 ins., max. 48 ins.
Frank Parsons Paper Co. 8.92c

No. 4—250,000 lbs., 25x38—70; flat cut 24x38, 28x38, and 38x48 ins.
Frank Parsons Paper Co. 8.92c

No. 5—250,000 lbs. 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.
Frank Parsons Paper Co. 8.92c

No. 7—400,000 lbs., 25x38—70; rolls 19 and 38 ins. wide (43-inch fiber cores). cores).
Mudge Paper Co. .....
(300,000 lbs. only on Lots 7 & 8) 7.59c

No. 8—400,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide 43-inch fiber cores).
Mudge Paper Co. .....
(300,000 lbs. only on Lots 7 & 8) 7.59c

No. 9—400,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores).
Barton, Duer & Koch Paper Co. ..
(200,000 lbs. only. Ceiling price at time of shipment). 7.59c

No. 10—200,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Machine-Finish Book End Paper

No. 18—80,000 lbs., 25x38—160; flat, cut 38x50 ins.; the grain to run the 38-inch way.

Offset Book

No. 19—200,000 lbs., 25x38—80, flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.
Mudge Paper Co. (100,000 lbs. only). 9.92c
Central Ohio Paper Co .....
(50,000 lbs. only. Ceiling price at shipment). 9.92c

No. 20—500,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.
Franklin Research Co. .....
(less 1% 30 days). 10.50c

Antique Book

No. 22—50,000 lbs., 25x38—90 and 120; flat, cut 33x43 and 38x50 ins.
Mead Sales Co. 7.57c
Stanford Paper Co. .....
(Ceiling price at time of shipment). 8.200c

50% Lightweight Machine Finish Books

No. 24—40,000 lbs., 25x38—60; flat, cut 30x43 and 38x48 ins. Min. order 10,000 lbs.

50% Antique Book

No. 26—40,000 lbs., 25x38—80; flat, cut 32x48 and 38x48 ins.

50% Laid Antique Book

No. 29—40,000 lbs., 25x38—140; flat cut 38x48 ins., the laid marks to run the 48-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Supercalendered Book

No. 33—200,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

No. 34—200,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).
R. P. Andrews Paper Co. 7.51c
Mudge Paper Co. (200,000 lbs. only). 7.51c

Coated Book

No. 37—500,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.
Barton, Duer & Koch Paper Co. .. 7.82c

No. 38—500,000 lbs. 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.
Barton, Duer & Koch Paper Co. .. 7.28c

No. 39—400,000 lbs., 25x38—100 and 120; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

No. 40—750,000 lbs., 25x38—140; flat, cut 32x42, 38x48, 39x50 and 41x52 ins.; the grain to run lengthwise of the sheet.
Consolidated Water Power & Paper Co. 9.232c

Dull Coated Book

No. 42—50,000 lbs., 25x38—140; flat, cut 28x41 and 32x42 ins.; the grain to run lengthwise of the sheet.
Stanford Paper Co. .....
(Ceiling price at time of shipment). 11.79c

Chemical Wood Mimeographed, White and Colored

No. 45—2,750,000 lbs., white, No. 40; flat, cut 28½x34½, 32½x42½ and 38x48½ ins.; the grain: size 28½x34½ to run the 28½ in. way; size 32½x42½ to run the 42½ inch way; size 38x48½ to run the 38 inch way.
R. P. Andrews Paper Co. .....
(400,000 lbs. only). 7.91c
Barton, Duer & Koch Paper Co. ...
(400,000 lbs. only. Ceiling price at time of shipment). 7.61c

No. 46—50,000 lbs., blue, buff, green, pink and yellow, No. 40; flat, cut 32½x42½ and 38x48½ ins. Grains: Size 28½x34½ to run the 28½ in. way, size 32½x42½ to run the 42½ in. way; size 38x48½ to run the 38 in. way. Min. order, one color, 10,000 lbs.
Cauthorne Paper Co. 9.25c

25% Mimeograph

No. 47—1,300,000 lbs., No. 40; flat, cut 28½x34½, 32½x42½; 34½x44; and 38x48½ ins.; the grain: size 28½x34½ to run the 28½ in. way; size 32½x42½ to run the 42½ in. way; size 38x48½ to run the 38 in. way.
Old Dominion Paper Co. .....
(200,000 lbs. only). 10.84c
Howard Paper Mills, Inc. .....
(100,000 lbs. only). 10.18c

Duplicator Copy Paper, Liquid Process, White and Colored

No. 48—100,000 lbs., white, No. 40; flat, cut 32x42 and 34x44 ins.; grain to run lengthwise of the sheet.
Eastern Corp. 10.23c
Stanford Paper Co. .....
(Ceiling price at time of shipment). 10.50c

Blue U S M O Safety Writing

No. 50—250,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).
R. P. Andrews Paper Co. .....
(125,000 lbs. onyl). 14.25c
D. L. Ward Co. (100,000 lbs. onyl). 13.99c

Chemical Wood Writing, White and Colored

No. 52—150,000 lbs., white, No. 26, flat, cut any size, min. width 21 ins., max. width 48 ins.

No. 53—2,500,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
R. P. Andrews Paper Co. .....
(125,000 lbs. only). 14.25c
D. L. Ward Co. (100,000 lbs. only). 13.99c

No. 54—5,500,000 lbs., white, No. 40, flat, cut any size, min. width 21 ins., max. width 48 ins.
R. P. Andrews Paper Co. .....
(200,000 lbs. only). 8.49c
Whitaker Paper Co. .....
(300,000 lbs. only). 8.73c
D. L. Ward Co. .....
(500,000 lbs. only).
(Ceiling price at time of shipment). 9.94c
Frank Parsons Paper Co. .....
(500,000 lbs. only). 8.49c

No. 55—1,000,000 lbs., white, No. 32; rolls, min., width 16 ins., max. width 48 ins. (3-inch fiber cores).
R. P. Andrews Paper Co. .....
(450,000 lbs. only). 7.47c

No. 56—4,000,000 lbs., white No. 40; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

No. 58—500,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 32 and 40; flat cut any size min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Chemical Wood Writing (Titanium Dioxide Filled)

No. 61—1,000,000 lbs. No. 32; flat, cut 34x44 ins.
Barton, Duer & Koch Paper Co. ...
(400,000 lbs. only without titanium. Ceiling price at time of shipment). 8.49c
(400,000 lbs. only. Ceiling price at time of shipment. 9.45c

50% Lithograph-Finish Map

No. 64—10,000 lbs., Nos. 32 and 40; flat cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

No. 65—68,000 lbs., Nos. 48 and 56; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

75% Lithograph-Finish Map

No. 66—80,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; ream markers to be omitted.
Barton, Duer & Koch Paper Co. ...
(40,000 lbs. only). 19.55c

Chemical Wood Manifold, White and Colored

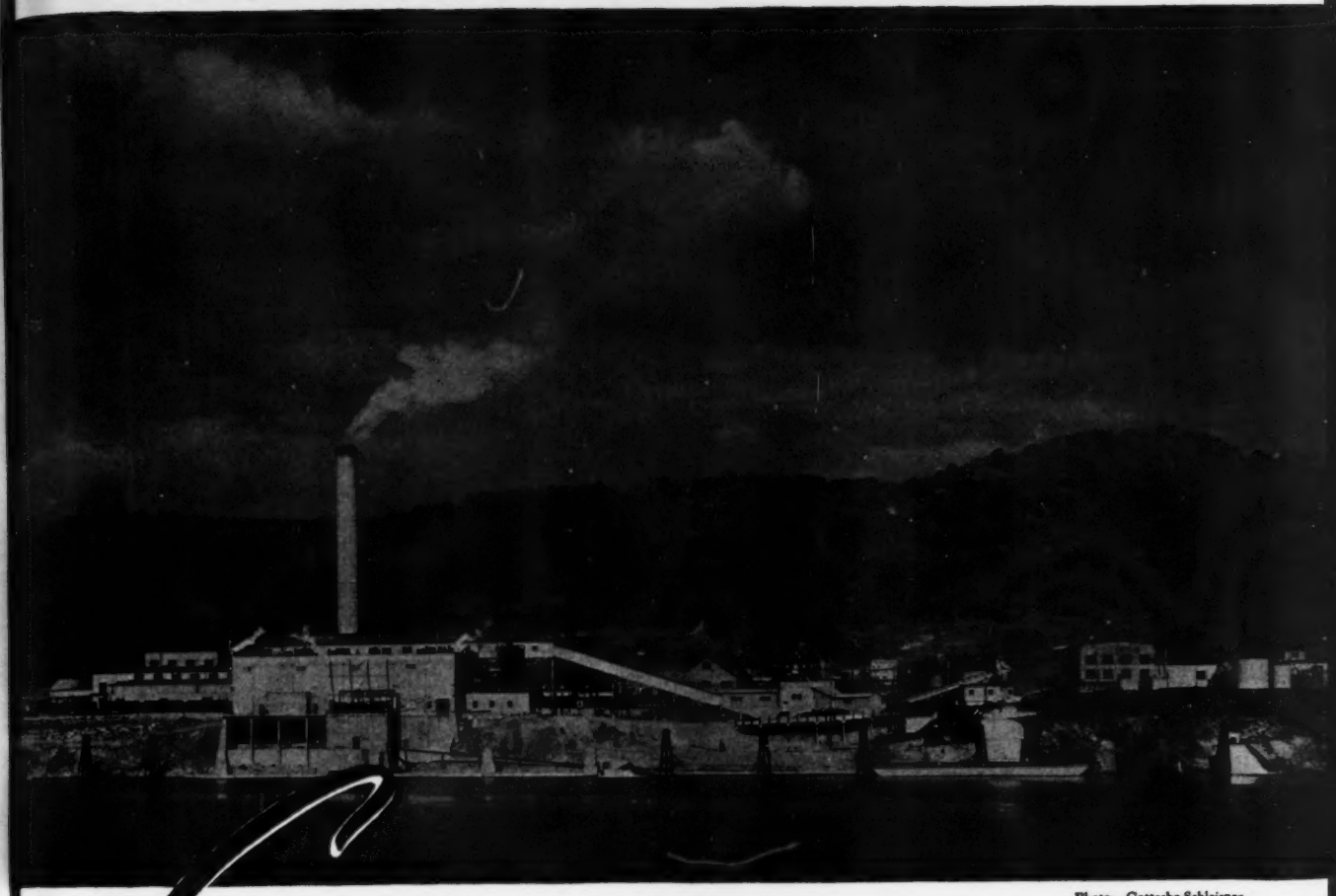
No. 71—100,000 lbs., No. 18; flat, cut 21x32, 28x34, 32x42 and 34x44 ins.
Graham Paper Co. 13.33c

No. 73—50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow. No. 18; flat, cut 28x34, 32x42, and 34x44 ins. Min. order, one color, 5,000 lbs.
Graham Paper Co. 13.33c

50% Manifold White and Colored

No. 76—50,000 lbs.; white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.
Old Dominion Paper Co. .....

(Continued on page 64)



Photo—Gottscho-Schleisner

Columbia buys Natrium, W. Va. Plant

The chlorine-caustic soda plant at Natrium, W. Va., has just been added to Columbia's facilities.

Built and operated by Columbia for the Defense Plant Corporation, the Natrium Plant bids to be a major factor in serving peacetime industry just as it was in producing gigantic quantities of chlorine and caustic soda for critical war industries.

This important plant, added to the facilities at Barberton, Ohio, and Corpus Christi*, Texas, is a step in Columbia's expansion program planned to meet the demand of industry for these essential chemicals.

*Southern Alkali Corporation (A Columbia Affiliate)

COLUMBIA ESSENTIAL INDUSTRIAL CHEMICALS

Soda Ash • Caustic Soda • Liquid Chlorine • Sodium Bicarbonate • Pittchlor (Calcium Hypochlorite) • Silene EF (Hydrated Calcium Silicate) • Calcium Chloride • Soda Briquettes • Caustic Ash • Phosflake • Calcene T (Precipitated Calcium Carbonate) • Modified Sodas.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
FIFTH AVENUE at BELLEFIELD • PITTSBURGH 13, PA.

CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • NEW YORK • CINCINNATI • CLEVELAND
PHILADELPHIA • MINNEAPOLIS • CHARLOTTE • SAN FRANCISCO

(50,000 lbs. only). 24.734c
Paper Corp. of U. S. .....
(Ceiling price at time of shipment). 25.06c

No. 78—40,000 lbs., blue, buff, cherry, green, pink, salmon and yellow. No. 18; flat, cut 28x34, and 34x44 ins. Min. order, one color, 5,000 lbs.
Old Dominion Paper Co. 25.487c
Paper Corp. of U. S. .....
(Ceiling price at time of shipment). 26.13c

100% White Manifold

No. 84—40,000 lbs., No. 18; flat, cut 32x42 ins. Min. order 5,000 lbs.
Paper Corp. of U. S. .....
(Ceiling price at time of shipment). 38.53c

50% White Glazed Manifold

No. 85—40,000 lbs., No. 16; flat, cut 28x34 ins. Min. order 20,000 lbs.
Barton, Duer & Koch Paper Co. ... 29.00c

Chemical Wood Bond, White and Colored

No. 102—500,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins.; max. width 38 ins.
Eastern Corp. 9.26c
D. L. Ward Co. .....
(250,000 lbs. only. Ceiling price at time of shipment). 9.26c

No. 103—50,000 lbs., blue, No. 32; flat, cut 32x42 ins.
Eastern Corp. 10.67c

25% Bond, White and Colored

No. 105—150,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 48 ins.
Barton, Duer & Koch Paper Co. ... 18.15c
Howard Paper Mills, Inc. 17.83c

No. 106—300,000 lbs., white, No. 32; flat, cut any size min. width 21 ins., max. width 48 ins.
Howard Paper Mills, Inc. .....
(150,000 lbs. only). 14.23c
(150,000 lbs. only). 14.73c

No. 107—400,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Howard Paper Mills, Inc. .....
(200,000 lbs. only). 14.23c
(200,000 lbs. only). 14.73c

No. 108—300,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Howard Paper Mills, Inc. .....
(150,000 lbs. only). 14.23c
(150,000 lbs. only). 14.73c

No. 109—400,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.
R. P. Andrews Paper Co. .....
(50,000 lbs. only). 13.744c
Whitaker Paper Co. .....
(50,000 lbs. only). 13.744c
Wilcox, Walker, Furlong Paper Co.
(50,000 lbs. only). 13.744c
Central Ohio Paper Co. .....
(50,000 lbs. only). 13.744c
Cauthorne Paper Co. .....
(50,000 lbs. only). 13.744c
Howard Paper Mills, Inc. .....
(200,000 lbs. only). 13.23c
(200,000 lbs. only). 13.73c

No. 110—100,000 lbs., No. 32; rolls, 21 ins. wide (3-inch fiber cores).

No. 111—100,000 lbs., No. 40; rolls, 21 ins. wide (3-inch fiber cores).

No. 112 — 50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 26; flat, cut 34x44 ins., min. order, 5,000 lbs.
Howard Paper Mills, Inc. 19.03c

No. 113 — 300,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size min. width 21 ins. max. width 48 ins.
Howard Paper Mills, Inc. .....
(150,000 lbs. only). 14.93c
(150,000 lbs. only). 15.47c

No. 114 — 50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.
Howard Paper Mills, Inc. 14.47c

100% White Bond

No. 128—40,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 38 ins. Min. order, one substance, 2,000 lbs.
Barton, Duer & Koch Paper Co. ... 28.00c

Chemical Wood White Ledger

No. 150—50,000 lbs., No. 48, flat, cut any size, min. width 17 ins., max. width 48 ins.
Eastern Corp. 10.23c
D. L. Ward Co. .....
(Ceiling price at time of shipment). 10.23c

No. 153—800,000 lbs., No. 88, flat, cut any size, min. width 17 ins., max. width 48 ins.
Eastern Corp. 10.23c

25% Ledger, White and Colored

No. 154—150,000 lbs., No. 48; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order, one substance, 5,000 lbs.
Howard Paper Mills, Inc. 10.73c

No. 155—150,000 lbs., No. 64; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order 5,000 lbs.
Howard Paper Mills, Inc. 14.73c

No. 156—50,000 lbs., white, No. 88, flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min order 5,000 lbs.
Howard Paper Mills, Inc. 14.73c

No. 157 — 50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 64, flat, cut 34x44 ins. Min. order one substance, one color, 5,000 lbs.
Howard Paper Mills, Inc. 15.43c

No. 158 — 50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 88, flat, cut 34x44 ins. Min. order, one substance, one color, 5,000 lbs.
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Chemical Wood White and Colored Index

No. 183—200,000 lbs., white, 25½x30½—220 and 280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheet. Min. order, one weight, 10,000 lbs.

50% Index, White and Colored

No. 189—350,000 lbs., white, 25½x30½—220 and 280; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.
Barton, Duer & Koch Paper Co. ... 16.00c

100% White Index

No. 196—150,000 lbs., 25½x30½—250; flat, cut 20½x30½ ins.
Barton, Duer & Koch Paper Co. ...
(100,000 lbs. only). 27.25c

Antique-Finish Cover, White and Colored

No. 203—50,000 lbs., 20x26—100; antique, white, blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea and yellow; flat, cut 25¼x39, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.
R. P. Andrews Paper Co. .....
(5,000 lbs. of a color). 9.24c
(10,000 lbs. of a color). 9.03c
Whitaker Paper Co. 9.27c

50% Laid Cover, Colored

No. 206—30,000 lbs., blue, cream white, gray and green, 20x26—130 and 200; flat, cut 25¼x39 and 28x41 ins., with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.
R. P. Andrews Paper Co. 14.88c

Wood Manila

No. 208—50,000 lbs., 24x36—80 and 100; flat, cut 25x38, 32x42 ins., with projecting colored-paper marker between each 500 sheets.

No. 209—100,000 lbs., 24x36—80 and 100; rolls, 21 ins. wide (3-inch fiber cores).

Chemical Wood Manila

No. 211—50,000 lbs., 24x36—140 and 160; flat, cut any size. Min. order, one weight, 5,000 lbs.

No. 2 Kraft

No. 217—100,000 lbs., 24x36—80 to 160; flat, cut any size, in wrapped bundles.

No. 218—100,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles.

No. 219—150,000 lbs., 24x36—80 to 160; rolls, min. width 9 ins., max. width 48 ins., wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

Desk Blotting, Colored

No. 255—50,000 lbs.; moss green; flat 19x24—200, in wrapped bundles. Min. order 5,000 lbs.

R. P. Andrews Paper Co. 9.43c
Barton, Duer & Koch Paper Co. .. 9.50c
Old Dominion Paper Co. 9.444c
Whitaker Paper Co. 9.07c
Mudge Paper Co. 9.50c
Central Ohio Paper Co. .....
(1,500,000 lbs. Lots 325, 326 & 327). 9.25c
(10,000 to 50,000 lbs. Ceiling price at time of shipment). 10.00c
(Shipment less than 10,000 lbs.). 10.50c
D. L. Ward Co. 9.50c
Cauthorne Paper Co. 9.32c
Stanford Paper Co. 9.50c

High-Finish Red Sulphite

No. 265—10,000 lbs.; flat, 24x36—320; in wrapped bundles. Min. order 5,000 lbs.
Mudge Paper Co. 9.23c
Paper Corp. of U. S. .....
(Ceiling price at time of shipment). 10.18c

High-Finish Chemical Wood Manila Tag

No. 271 — 50,000 lbs., 24x36—280; flat, cut any size, min. width, 24 ins., max. width, 38 ins.

Jute Tag

No. 280—50,000 lbs.; 22½x28½ — 200 and 280; flat, cut 34x44 ins. Min. order, one weight, 10,000 lbs.
Mudge Paper Co. 11.75c
Paper Corp. of U. S. .....
(Ceiling price at time of shipment). 12.00c

Railroad Board, White and Colored

No. 304—20,000 sheets, ash gray, green, orange and red, flat, 22x34 ins., 4-ply, each 100 sheets fully banded. Min. order, one color, 5,000 sheets.

Wood Cardboard, Colored

No. 307—100,000 lbs., buff, 22½x28½—150; flat, cut 32x42 ins.

No. 308—40,000 lbs., melon, 22½x28½—184; flat, 20x30 ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets.

No. 309—50,000 lbs., blue, buff, gray, green, melon, pink and yellow; 22½x28½—184; rolls, 20 inches wide (6-inch iron cores).

Chemical Wood Tan Board

No. 310—100,000 lbs., 22½x28½—200; flat, cut 19½x28½, 25x38 and 34x44 ins.
Paper Corp. of U. S. .....
(Ceiling price at time of shipment). 10.00c

United States Postal Card Paper

No. 325—2,000,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter and 33 ins. wide, 36 ins. in diameter (6-inch iron cores).

(Continued on page 158)

COOPER'S 25 YEARS

. . . and what they mean to users of Stainless Steel Castings

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Boston Trade Plays At Day's Outing

BOSTON, Mass.—In the business session at the Outing of the Boston Paper Trade Association at the Charles River Country Club, Newton Centre, Mass., June 10, it was voted to send $300 to C.A.R.E. (Cooperative for American Remittances to Europe) to buy food packages for hungry Europe. This sum will feed 20 families of four for 15 days.

The outing was an exceedingly pleasant occasion, with fair skies and an attendance of 136. Luncheon was served in the Locker Building from 11:30 on.

After the dinner, with President James R. Carter II in the chair, the following new members were elected:

Regular membership — Donald Wyman; Philip Richardson, of Storrs & Bement Company. Limited membership—Harry E. Riggs and Robert B. Clark, Jr., both of the Strathmore Paper Company; Frank R. Newton and Dr. Earl H. Barclay, both of Kupfer Bros. Co.; Jack B. Cowie, Hollingsworth & Whitney Company.

Prizes were awarded to the following winners in the golf tournament: Class A, low net, Harry Lawless (entitling Mr. Lawless to have his name enscribed on the new championship cup, which already bears the name of Norman Harrower, low net in 1942); 2nd net, Herbert Fowler; 3rd net, Norman Harrower; low gross, Jack Whitney. Class B, low gross, J. Levis; 1st net, Ralph White; 2nd net, J. Dixon; 3rd net, Karl Ways. Class C, best selected nine, Lewis Bills. Kicker's handicap, Graham Blandy, 2nd. Guest prize, W. R. Whitney.

Prize winners in the outdoor sports were: Horseshoes—1st, John Calligan; 2nd, John A. Andrew, Jr.; 3rd, James Dwyer. Putting—1st, Edgar P. Hay; 2nd, Ray Allen (tied with Charles A. Esty, but won the toss). Bowling—1st, Willard H. Loud; 2nd, Dudley Ross. Baseball—the Rusty Faces, with the battery of Cheever and Walsh, won over the Never Sweats by the score of 20-7. The winning team was made up of luminaries, all of whom shone, while John Shea, of the Central Paper Company, shone for the losers. Ten door prizes were awarded.

The golf committee was composed of Everett Ketcham, chairman, Nelson Feeley, Norman Harrower, E. L. Cummings and Henry Bigelow. Outdoor sports committee, Howard Wallingford, chairman; Hubert Lockhart, horseshoes; Daniel Abercrombie, Jr., putting; John A. Andrew, Jr., bowling; David Cheever, baseball.

KALAMAZOO TAPPI ENJOYS FUN DAY

New officers of the Kalamazoo valley section of the Technical Association of the Pulp and Paper Industry, elected at the annual fun day meeting at the Elks Country club, June 7, are shown here, with the chairman of arrangements for the day and a national TAPPI officer. Left to right, those shown are Carl Hoederle, chairman for the day; James A. Wise, national TAPPI vice president; Myron Floto, treasurer; Lee Mimms, vice chairman; and P. W. Bartholomew, secretary. In front of the group are the prizes offered winners in the day's contests. R. T. Mashburn, newly elected chairman of the section, was unable to be present.

Lakes TAPPI Section Elects Dr. Forman Chairman

APPLETON—Dr. Loren Forman, of the staff of the Institute of Paper Chemistry, was elected chairman of the Lakes States section of the Technical Association of the Pulp and Paper Industry. He succeeds Dr. Phillip Dixson, of the Fox River Paper Corp.

John West, of Kimberly-Clark corporation, was elected vice chairman, succeeding Dr. Forman and Dr. A. M. Heald, of the Marathon corporation, was elected secretary and treasurer, succeeding Robert A. Stillings, of Kimberly-Clark corporation.

Gus Enderlein, Mosinee, and R. C. McKee of the institute staff, were elected to the board of directors.

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Tough job, trying to eat up that backlog! Every little short-cut helps, though. Ever think of trying to reduce "down time" for repairing wires and screens, cutting down wash-up time and thereby increasing production? And would not a material reduction in rejects and "seconds" step up output?

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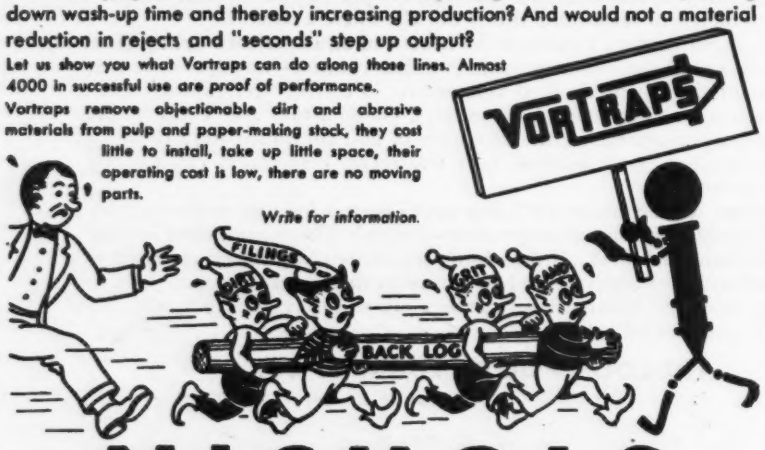

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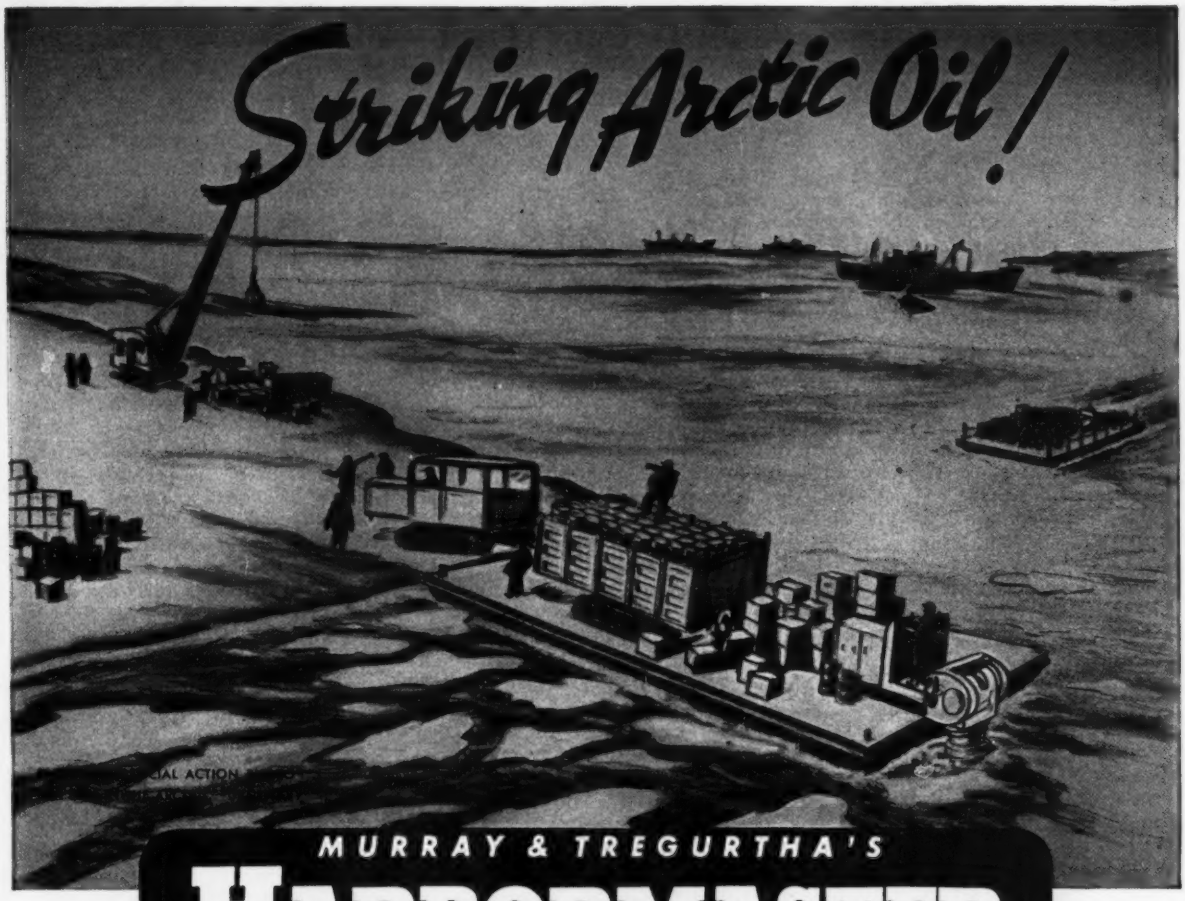

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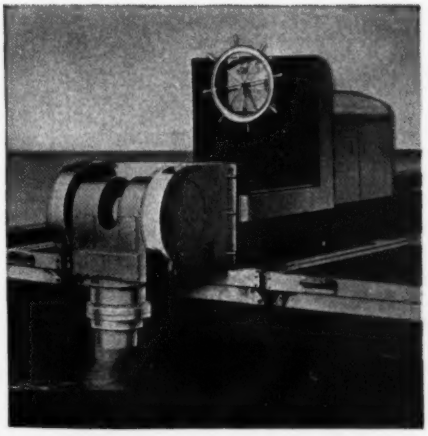

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Drives, Vats and Screens for Board Machines*

By Allen A. Lowe[1]

Abstract

A power transmission which has been developed so that the prime mover and line shaft can be placed on the machine room floor is described. It involves the use of a V belt and a hypoid corner drive. Also mentioned is a new design vat which can be operated by either direct and counter floor and an improved flat screen.

The bottleneck thought is the sensible method of arriving at the solution of the industry-old problem of how to get better and more production by improving such parts of the equipment as are preventing such improvement. A very simple example is the machine on which the papermaker is able to form more than he can dry. The bottleneck is the drier part and the solution is more driers.

By working from one part of the machine to another under the bottleneck system, many of the problems are solved more easily because the whole attention of the papermaker is concentrated on one point and when he solves his problem here he is free to go on to the next demonstrable bottleneck.

The bottlenecks to which the Sandy Hill Iron and Brass Works feels it has some of the answers and which are being discussed here are power transmission, vat design, and screen design. As answers to these potential bottlenecks, an advanced design in mechanical drives for a paper machine, a vat containing some thoughtful and forceful answers to the problems of formation at increased speeds, and the screen which has served the paper mills well for half a century in its newest and most efficient form are presented.

Drives

To begin with, the drive; paper machine operation has progressed in speed only as the drive of the machine has been improved.

The first paper machines were short and ran at slow speeds because they were operated with parallel belt drives without cone pullies. There are papermakers living and some of them are not too old who lagged pullies to get the draws. This was possible only when machines operated at speeds of 100 or 200 feet per minute.

A great step in advance came when in 1870 Mr. Marshall introduced the old Marshall train. It provided for change of draw by cone pulleys, maintenance of relation of speeds of sections by the line shaft, and the necessary change in direction of rotation were provided by the mortise gear and cast iron or steel pinion. Paper machines up to 1000 feet of paper speed per minute have been operated by such a device but not many and not for long. Most can remember when the newsprint and kraft people were seeking for a drive to go along with their belief in their ability to form a sheet at upwards of 1000 feet per minute.

Speed is not the only improvement sought by the papermaker. Efficiency in power transmission, increased range and control of draw, economy of maintenance and lubrication, economy of space were improvements sought by fine paper mills whose rate of formation was restricted and, of course, by board machine operators.

Solutions to these problems are offered, one of which is a drive which goes a step further. Incorporating the variable pitch V-belt in the drive to take the place of the cone pulleys, the space requirement is brought nearly to an irreducible minimum. It is no longer necessary to occupy valuable space in a basement or set a line shaft on an expensive structure of steel. The prime mover and the line shaft may now be placed on the machine room floor.

The selective drive is set up as follows: it is based on the hypoid corner drive. Heat-treated, narrow-clearance steel gears running in oil are enclosed in a substantial cast iron case. This gear unit is the rock on which the drive is based. Each gear is carried on a shaft which runs from side to side of the case supported in anti-friction bearings. It is difficult to see how anything can cause misalignment and improper meshing of the gears.

A cut-off coupling is used. The shaft carrying the stationary sheave is supported on two anti-friction bearings. All of the foregoing is mounted on a substantial cast iron base.

As a whole it presents a sturdy, practically frictionless corner drive.

The new feature is the use of variable pitch V-belt sheaves to give the variation in draws at the sections. The use of V-belts reduces the required distance between corner and line shaft to a minimum and so takes the line shaft out of the basement or off of a steel structure in the machine room. The use of V-belts has several byproducts not involved in the economy of space. It does away with flat belts and the nuisance of slippage, taking up, and breaking. It permits twice the adjustable draw range of the standard cone pulley setup. The draw is also steadier. On cone pulleys the belt shifter controls the belt running over the nearest pulley, but there can be some variation on the more distant pulley.

The speed of the line shaft on this installation is normally higher, permitting the use of smaller line shafting.

Some of the points worth noting are these: the varipitch sheaves are made interchangeable and integral with the line shaft; the idler arms are controlled and cushioned by shock absorbers; one feature is the adjustment of draws from the front side of the machine by remote control electric units; and the factor of safety is such that if one V-belt breaks it is not necessary to replace it until convenient.

The combination of V-belt drive with antifriction bearings and hypoid gears running in oil makes a combination which would have amazed Mr. Marshall as much as his train pleased the papermakers of his time.

Another byproduct of the drive is ease of inspection and supervision. Everything is on one floor and in general week-to-week attention to lubrication is sufficient instead of day-to-day or shift-to-shift as is

* Presented at the meeting of the American Pulp and Paper Mill Superintendents Assoc., held at Poland Springs Hotel, Poland, Me., June 19, 1946.

[1] Sales Promotion Mgr., The Sandy Hill Iron & Brass Wks., Hudson Falls, N.Y.

sometimes the case in the older types of drive.

Visual oil gages show the oiler or mechanic the condition of the oil in the gear cases.

An advantage of the drive is that understanding of all its parts and their replacement and adjustment is within the scope of the usual competent millwright present in every paper mill. Frequent replacement or adjustment are not anticipated but when the emergency arises it is not necessary to call in an expert or employ one that he may be available in an emergency.

First cost of the complete drive for a machine is favorably comparable to the cost of a complete drive of the older mechanical type and distinctly favorable compared to a sectional electric installation. To recapitulate the advantages roughly the economies are in: capital investment, floor space, friction load, lubricants, maintenance, shutdowns, and man hour supervision.

A 120-inch machine running at about 600 feet per minute is running full time with this drive and has been running this way since its recent start-up.

This is an economical, smooth operating piece of equipment. It is quite possible that with it many papermakers will make steps in advance in production which seem always to have accompanied radical improvements in paper machine drives.

Vats

Another important bottleneck in board machine operation is the vat. This, of course, means the formation of a satisfactory sheet at increased speeds.

The problems involved, and to which there are still no exact answers are direction of flow in relation to the direction of movement of the cylinder mold, the rate of flow in relation to the surface speed of the cylinder mold, the quantity of flow, the size of the cylinder mold, the available differential head and the distribution of the approach flow.

The vat which is offered for consideration has some features which are widely used by all paper mill machinery builders. These are the fabricated design employing stainless steel and other corrosion-resistant metals and antifriction bearings.

To help the papermaker solve some of the other problems the following points in design have been incorporated in a series of vats which have been built and some of which are in operation. The decision as to direct flow and counter flow is one which will be arrived at by conference between the buyer and machine company engineers. There are reasons in relation to the individual buyer's paper and general operation which are valid to one and not to another. Some of the men who are recognized throughout the industry as leaders in the field do not agree, as all know. Many of them will say, "I see why Jones uses counterflow vats but I don't feel they are suitable for my operation." We also know that some leading papermakers recommend some counterflow and some direct flow on the same machine. The Sandy Hill vat lends itself to either decision.

The rate of flow in relation to the surface speed of the mold can be controlled by the amount of stock passed through the circle aided by a generous overflow. This speed at different points through the circle may also be controlled by the location of the cylinder mold in relation to the circle. The possible variation of the shape of the section of space between mold and circle is shown in the diagram.

The vat provides both of these controls and it is offered for either direct or counterflow vats. On a counterflow vat the overflow to the circulating pump is taken directly rather than allow it to mix with the white water from inside the mold to prevent what is likely to be thick stock from getting into the mill white water system.

The vat also has incorporated the multiple manifold flow distributor. This presents the solution to two requirements for the best approach flow to any formation unit, and especially to a multicylinder machine vat.

General design requirements make it desirable to come from the machine screens to the vat as nearly as possible at right angles to the travel of the felt. Competent investigation has shown that the 90° elbow in the pipe must be a distance of several times the pipe from the vat. With the Bertrams design of multiple manifold approach flow unit the pipe from the screens may come to the distributor from any angle or distance and have no bad effect on the delivery to the circle.

To give further control of the distribution an adjustable slice is offered. By the use of this slice a partial direct flow and counterflow effect may be secured.

A fundamental of vat design in line with the present day paper mill thinking is the provision of generous white water discharge passages, cross overs, and connections to a pump box or circulating pump. Papermakers are moving toward thinner and thinner consistencies and for many mills just the provision of increased flow passages would be a step in advance. Generally speaking, this design of vat gives the best solutions to the problems of distribution of approach flow and the maximum opportunity for the papermaker to vary flow through the vat as the needs of his formation problem require.

Machine Screening

The third bottleneck with which this paper deals is adequate machine screening with greatest possible economy of space.

Adequate machine screening provides for carding the stock and a final cleaning. Paper machine screens have as their primary function making sure that each fiber floats alone before going into the vat. It breaks up lumps and tends to prevent those concentrations of fiber called streaks. Some few mills still use paper machine screens for a last cleaning.

In either case, any improvement of the capacity per plate of the screen leads to a reduction of the size of the screens, economizing on space or by permitting the reduction of the slots gives a better cleaning and carding action within the same space.

The latest improvements on the flat screen which have led the paper and pulp mill field in the United States for years give better capacity per plate, reduced maintenance and longer life of the parts.

Development in the war years has produced the following changes: The permanent structure of the screen has been added to by making the diaphragm frame of cast iron rather than wood. Most know where there are screens whose base parts of cast iron are forty to fifty years old. One further stage with the cast iron has been reached.

The greater part of the frame does not come in contact with the stock. Those parts which do, the spouts, are made of silicon bronze. These spouts are made 3 × 20 inch in cross section to give the greatest possible discharge from the individual diaphragm chamber. The diaphragms are bolted to the frame with stainless steel bolts.

In reference to a screen with wooden vat, flow box, and frame the frame is the most expendable part. With the addition of the cast iron frame to the end stands and girt a cause of expense is eliminated.

On all-metal screens the cast iron is the natural material to use. The all-metal screen is offered to the trade to conform to the present day thinking that corrosion-resistant metals are the materials to use for such a purpose. The all-metal screen includes vat and flow box of silicon bronze. Provision is made for screw-type plates or beveled-edge plates.

However, good cypress vats and flow boxes are still a sound investment if used with the cast iron frame.

A step in advance in standard equipment on flat screens is the provision of dams for each two plates. This permits the adjustment of flow through the screen so that each plate takes its share of the flow. Increased production may be obtained in this way. There is also increased cleanliness since there are no diaphragm chambers left to dry up.

The real progress in screening capacity has been in the adoption and improvement of roller shoes. The essential principle of the Packer screen — the free fall of the agitating mechanism—was preserved when the Fancher roller shoe was invented. The Fancher roller shoe gave the Packer screen a maintenance of capacity which amounted to an increase of 50% per plate.

The Fancher roller shoe presented certain problems of maintenance which have been corrected by the new roller shoe. This is done by the nose head guides eliminating any danger of misalignment and by the addition of roller bearings for the roller. The whole is continuously supplied with oil.

The free fall principle of the Packer screens is easy in its action on plates and avoids any tendency to pull dirt if there is a temporary matting over the stock on the plates.

Among the bottlenecks on a board machine which the papermaker will readily ascertain for himself are these three: power transmission, vat design and screen capacity. Some answers to these have been presented in the foregoing.

Dirt Removing Systems and Improvements*

By H. E. Ingalls[1]

Abstract

The two principal systems in which the Nichols Freeman Vortrap is used by the paper industry are described. The standard system is to be considered where there is the personnel to take care of the units, otherwise, the primary-secondary system, which is automatic, is to be preferred.

Recent improvements in the construction of the trap are noted.

In this discussion it is assumed that the industry has a general knowledge of the Vortrap and are working on the basis of recent applications and improvements. Fundamentally, the stock or liquid is delivered to the Nichols Freeman Vortrap at sufficient pressure to overcome the required pressure drop for effective removal of objectionable materials. There are three sizes in general use in paper mills. These are the 1½, 3 and 4 inch sizes: These figures indicate the diameter of the cylinder. Two other sizes, namely the 8 and 10 inch, are gaining favor in handling rough stock and in pulp mills for removal of heavy dirt and metallic particles.

Systems Used

There are two principal systems in general usage in the industry. These are the so-called standard system and the primary-secondary system. There are modifications for different applications, but for this discussion the two systems based on the standard layout are considered.

Standard

The standard system may be considered mainly for the removal of heavy inorganic dirt. This system is attractive only on installations which require a relatively small number of traps, as the operation of this system is through manual care. The standard system consists of one or more standard traps mounted in the most convenient manner. A single pump, used for supplying these traps, takes its suction from the white water box or the wire pit, depending on the machine system. This pump mixes the stock and white water and delivers it to the inlet. The outlet system is piped so that the accepted stock may be delivered through two control valves either to the machine or recirculated through the pump suction system, thus giving control on the machine and loading the system as required for efficient dirt removal. A water washline is piped to a fitting above the waste receiver and is used only for backwashing and filling the waste receiver.

The rejected dirt filters down into and is collected in the waste receiver at the base of the V trap. Periodically, this dirt must be washed out manually by closing the valve at the base of the cone and opening the valve below the waste receiver. After flushing the receptacle, this valve is then closed, the receiver filled with water, and the valve at the base of the cone is opened.

Primary-Secondary

In the primary-secondary system, the primary section is practically the same as the standard system, with the following additions. A master valve is recommended at the discharge point of the outlet header. Control of stock beyond this valve is the same as with the standard system. It is necessary to pipe a ¼-inch washline to the base of each waste receiver for dilution purposes and a ¼-inch valve is provided for control. At the top of this waste receiver a special union tee fitted with an orifice is provided which controls the rate of outward flow of liquid rejects from the receiver. This tee in turn is piped to the rejects header which receives rejects from all primary V traps and connects with the suction of the secondary V pump.

The secondary system consists of one or more secondary traps supplied by a pump which takes its suction from a supply of lean white water. The rejects from the primary system join with the white water close to the pump suction. The size and number

* Presented at the meeting of the American Pulp and Paper Mill Superintendents Association held at Poland Spring House, Poland, Me., June 18, 1946.

[1]Nichols Eng. & Research Corp., New York, N. Y.

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of secondary traps is based on the number of primary units, but in the larger systems one secondary unit will handle up to nine or ten primary units of the same size. The accepted stock from the secondary system is delivered to the suction of the primary pump for recirculation through primary traps before being delivered to the paper machine.

Many mills are successfully taking a continuous flow of rejects from their rotary screens at the head of the machine and introducing them laterally into the suction pipe to the secondary pump, and thereby eliminating the need of auxiliary screens. This practice is steadily increasing in popularity.

Briefly, the primary-secondary system functions as follows. A master valve which is provided at the discharge of the outlet header acts as an orifice, and once set for the proper difference in pressures, need not be changed unless the system, in general, is changed as regards total stock gallonage. This master valve maintains a constant pressure in the outlet header, which in turn provides constant pressures at all other relative points in the traps. The ¼ inch dilution line at the base of the receiver, when provided with a constant pressure and volume of water, can be adjusted for a constant and uniform dilution in the waste receiver. This means that a constant volume of diluted fiber and rejects is discharged through the controlled orifice in the outlet of the receiver and rejects are continuously carried through to the secondary system.

It is important that the consistency in the secondary system be kept as low as possible, preferably to ¼ of 1%. It is recommended that the dilution white water be very low in fiber content, and with this dilution, dirt removal is increased and the rejects from the secondary trap are relatively low in fiber content. Fresh water is also introduced at the base of the secondary receiver. The same principle of a continuous discharge through a controlled orifice is again applied. This results in the final rejects of this system being discharged in a stream of almost clear water, with resultant minimum fiber losses.

In systems on machines making grades of paper containing 10% ash or less, the total solids rejects loss usually runs between 3 and 5 pounds per ton of paper. This loss includes dirt, organic matter, and fiber. Sheets having an ash content of higher than 10%, show an increase in solids rejects, but tests have shown that often this increase usually includes rejected filler which is not to be desired in the finished sheet.

Pressure

Pressures are important to efficient operation of the systems. Under practically all conditions, the pressure on the inlet header of the primary system should be 30 pounds where there is no static lift of the stock at the discharge of the system. Pressures on the outlet header should be from 5 to 8 pounds, giving a 22- to 25-pound differential. For a single unit, the inlet pressure should be approximately 25 pounds and the outlet pressure from 4 to 7 pounds. This gives an 18- to 21-pound differential in the single unit installation. The system should be designed and pumps selected carefully to obtain these recommended pressures and avoid a needless waste of power.

General Operation

In general, the standard system may be considered for the removal of heavy dirt on machines and systems where the machine tender or some other person has time to take care of the system and dump the waste receivers.

The primary-secondary system will remove the heavy and the fine dirt, as well as a considerable quantity of undesirable organic material. The primary-secondary system operates automatically and rejects foreign matter continuously, requiring only occasional observation and checking.

In accomplishing fully automatic operation in the primary system, it is essential that a few points be carefully engineered at the time of installation. These consist of:

1. Provide a master valve which will give a constant outlet pressure and means of control. Beyond this valve it has been found that if the valve to the machine or screens is opened liberally, that all stock control to the machine can be obtained by varying the recirculation valve.

2. Controlled fresh water supply for dilution at the bottom of the waste receivers. The pressure control can be accomplished by a pressure reducing valve in the incoming supply line. It is recommended that this be preceded by a strainer which can be flushed out occasionally if the water is dirty. It has been found that a water pressure between 25 and 30 pounds is satisfactory, depending on the pressure in the outlet header. This line should be of sufficient size for supplying the proper volume.

3. Proper introduction of liquids and stocks in pump section pipes for steady flows and uniform consistencies.

Improvements

At this point some recent improvements are considered. It has been noted that a variance in flow is apparent in the sight glasses of the primary-secondary traps. This, it is believed points directly to distortion or wear of the diaphragms. There are now stainless steel diaphragms to correct this condition and they provide a much longer life than diaphragms previously used.

The wear on the copper and rubber orifices has been causing minor troubles. Stainless steel orifices are now offered for this service and it is suggested that in all future replacements these stainless steel parts be considered.

In mills having an exceptional amount of abrasive dirt or chemical conditions in their stock system, cylinder wear in some cases has been excessive. To correct this, cylinders with stainless steel construction are furnished. The increased cost of this construction is very small and it is to be noted that with this special design, an increased capacity is obtained which more than offsets the increased cost.

The units can be furnished in special materials, such as all stainless steel construction, rubber lined units, lithcoting, or other enameled construction.

A survey of the installations in the United States was made recently and it was found that more than 2200 Vortraps are installed in over 200 separate paper mills in the United States: approximately 4000 Vortraps are in world-wide use. At this point it should also be noted that these installations have been made within the last ten years, during which time new installations were restricted through the war period. These installations are on practically all grades of pulp and paper stock including tissue, glassine, rag, book, and bond, groundwood, sulphite, and soda pulp specialties, news, unbleached and bleached kraft, rope, straw, hemp, rough stock, deinked stock, and many other special uses including water purification, oils, slurries of clays, graphite, pigments, etc.

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Your Part in Lithography's Future*

W. E. Griswold[1]

I am glad to have this opportunity to discuss with you some aspects of your part and ours in lithography's future particularly as they relate to coated paper. I am sure you have heard, through your sales departments and individual salesmen, the opinions and perhaps demands of individual lithographers for improvement in coated papers. And I refer to coated papers of the best standard ever produced independent of any present effect of war and post-war conditions.

"Give me a paper that will not have a retarding effect on the drying time of inks. Give me a paper with strong resistance to picking. Give me a paper on which the absorption of ink will be uniform. Give me a paper whose coating does not change the value of the fountain solution and necessitate constant checking and regulation." Have you ever heard those requests and complaints? Of course you have and many others.

And as technical and production men, you have ideas of your own based on whatever knowledge you have of the lithographic process. Some of these are listened to and put into action, some are not. Yet somehow I doubt if there is one lithographer who knows enough about the coated paper problems and possibilities of all the forty-six different kinds of lithographic plants to speak safely and authoritatively in guiding you to standards and characteristics of papers and paper performance that would assure you the efficient use of your equipment and manpower in a manner making certain that you realize your full share in the future expansion of the lithographic industry as a whole.

Let's not kid ourselves. There are not more than ten or a dozen technical men in the lithographic industry qualified from a scientific standpoint to get at the reasons why and report them for a technical man in a paper mill to make use of in the development of improved coated papers. Of course, there are many practicing lithographers who can, by trial and error, tell what will and won't work satisfactorily and gradually arrive at methods that fit conditions in their own plant for getting a commercially satisfactory result in accordance with the standards of quality of that plant.

But with the whole ink-on-paper industry facing the urgent necessity of improved end-use value rather than cost per pound or per thousand pieces of printed material, neither of these guides is good enough if you and we are to have an important part in the future which lithography holds out.

And don't let us kid ourselves either, as paper salesmen are reported often in effect kidding lithographers in plants, by bragging over the great number of chemical engineers, technical and scientific men in paper mills, who insure a perfect sheet which the lithographer should accept without question. They omit mentioning the amount of lithographic process knowledge among paper technical men and the break down of the so-called research budget of the mill. There are a few lithographers and technical men in the lithographic industry who know the lack of such litho knowledge because they know you can't get it out of a book alone. They are fully aware also that a large part of the so-called lumped research appropriations of individual paper mills are in fact largely product control and testing and even as such perhaps not large enough to insure product control. They are sure that not enough fundamental or even advanced experimental research is carried on to insure development of coated papers particularly to meet the real, the special needs and the potential needs and opportunities of the present and changing market of the lithographers. Bear in mind that in meeting the demands of their customers, the manufacturers of consumer goods, the lithographers are in reality paper's representatives to hundreds of your ultimate customers with whom you cannot have economical contact.

Not believing there is a lithographer or a paper man who has sufficient scientific knowledge of all of the steps of this linked chemical reproduction process—or of lithographic paper making to draw concise specifications on what could or should be done to meet the needs of 46 kinds of litho plants. I certainly will not assume that responsibility. *Except*—I shall try to draw for you from a sample cross section survey of opinion made in the past three weeks some idea of a reasonable consensus of opinion of directions your research developments and reduction to practice might well take. Now I realize such a consensus will affirm or reaffirm many of the opinions you already have because I know you have some good ones but it may add a few suggestions of current vintage. I would rather present the matter for your consideration in this manner not only because I happen to believe in consensus of opinion through association with an organization of which George Gallup is a principal, for many years, but because it seems safer and more certain to reach sound recommendations and conclusions without obsoleting manpower and equipment too fast or with too great risk.

The record of the Lithographic Technical Foundation on the mater of the relationship of the process to the development of papers is clear and good. Yet I do not believe an institution such as ours should "rarr back" and issue a pronouncement of exactly what should and should not be done on staff opinion or casual survey or give arbitrary directions at this time, if at any time. This is a day when the modern tools of factual data in consensus of opinion and cooperative effort can be obtained and achieved for safer guidance.

I think the points of view of our Lithographic Technical Foundation research men, both their own from the standpoint of the technical aspects and techniques of lithography and from what they hear from the trade by correspondence and direct contact are very useful.

Likewise, I believe the opinions of a cross section of representative lithographers, as reported confidentially to their endowed, non-profit scientific research and educational institution, are very worthwhile. And they do answer our inquiries. So I have taken the trouble to supplement the regular flow of requests made on the laboratory for further technical information and trouble shooting on lithographic papers with this cross section of opinion. I assure you I will not inject any of my own opinions nor do I want you to accept the opinions expressed as pronouncements of the Foundation.

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* A paper read before the Coating Committee of the American Pulp & Paper Mill Superintendents Association, Inc., at Poland Spring, June 20, 1946.

[1] Executive Director, Lithographic Technical Foundation, Inc.

Now, let's grant that this might not be considered the time to make surveys on paper manufacture or lithographic production, but the way things are going the perfect time as judged by pre-war conceptions may never come. To a degree, we must rely right now on the memory of those expressing opinion of the development reached by coated papers for lithography in the relatively short time prior to the war. We must take into consideration the influence on their impressions and opinions of the contrast between what they are having to work with now at an all time peak of lithographic production and what they had then. We must also consider what they think they need to work with to meet the changing market and the increased demands being made on them from two directions: first, from the customer demanding better end-use values, greater amounts of illustrations and color and new work in order to make his merchandise, service or publication complete, and second, from the pressure that has been brought on production facilities to further remove or reduce human variables in the process itself, reduce wastes in make-overs, loss of time on press, etc., through better interpretation and application of research developments. This matter of bringing research into cut costs and the need for upgrading the skill of craftsmen to higher production efficiency is acute and, of course, was brought on by the somewhat artificial and abrupt increases in cost of labor, materials and overhead without the opportunity to increase prices accordingly. Research and employee training activities which incidentally are the principal purpose of the Lithographic Technical Foundation are in the greatest demand ever as a means of avoiding cutting further into decent profit levels and reserves while holding the quality production and customer satisfaction needed for the long pull.

Yet I observe a strange thing in the sincere and informative letters written to me as a basis for information to pass on to you.

It is not unlikely that we have here (and can obtain more of same if we wish) more constructive and useful information and suggestions than could otherwise be obtained, because of accumulated *perspective* on prewar coated paper experiences—*detachment from concern* with a particular job at hand or hot complaints made under the pressure of customer dissatisfaction, more series thought of the problems involved through contrast and comparisons with the present experience where paper production is more or less uncontrollable. And, of course, evidence that only a continuing survey is reliable anyway.

I told these key men in lithographic plants, research and technical men, I wanted the information to pass on to you just as if each one had the privilege of standing before you and saying what he thought you could do as your part in the promising future of the lithographic industry—particularly as to coated papers. No—no questionnaire. Spade work.

I give you here first the substance of one communication which is quite typical. The writer, who is general manager of a straight litho plant, lists four items which he believes should be presented to you.

"1. Coating and its effect on ink drying; his first comment

"Some coatings have a retarding effect on the drying time of inks; still other coatings promote chalking by causing an unusually large absorption of the vehicle. There certainly is much to be done with regard to the compatability of inks and coatings. Perhaps he means you should be just as interested in studies of ink receptivities and the lithographing qualities of pigments as caseins, resins, waterproofing, starch, grain, etc.

"2. Resistance to picking: his second point

"Efforts should be continued along the lines of improving coatings to the point where fairly large solids can be printed with inks of above average tack, and without picking. Certainly practical and readily available means of measuring tack and length of ink would be needed here.

"It has been our experience in checking deliveries of coated paper that very often coatings would pick under a #5 wax text, and other deliveries will stand up under a wax text as high as #12. Results have shown that we can obtain satisfactory results by offset printing on coating that will stand at least a #8 wax text. Anything above that is just an extra safeguard but is not necessary, and anything below #6 causes considerable difficulty.

"3. Absorption of ink should be uniform:

"Ink penetration still is not as uniform as it should be. This is due to the calendering operation which evens the surface of the paper, but causes spotty or uneven absorption of ink.

"4. Scumming:

"In many cases we have found that coated paper has caused scumming, and we are advised by our Laboratory that the cause of this is that the "pH" of the coating is on the alkaline side. This changes the "pH" value of the fountain solution and necessitates constant checking and regulation.

"We wonder if it would be possible to have the Paper Industry create a standard to eliminate this difficulty. Tremendous time is lost in the pressroom in overcoming a condition of this type." Okay, but doesn't there need to be more accurate knowledge of the pH of fountain solutions, a more general use of pH control than obtaining and process standards adjusted to paper standards?

Now I personally think that man is giving a frank and compressed opinion and he sound notes, of course, which run through many of the other communications. Here's another:

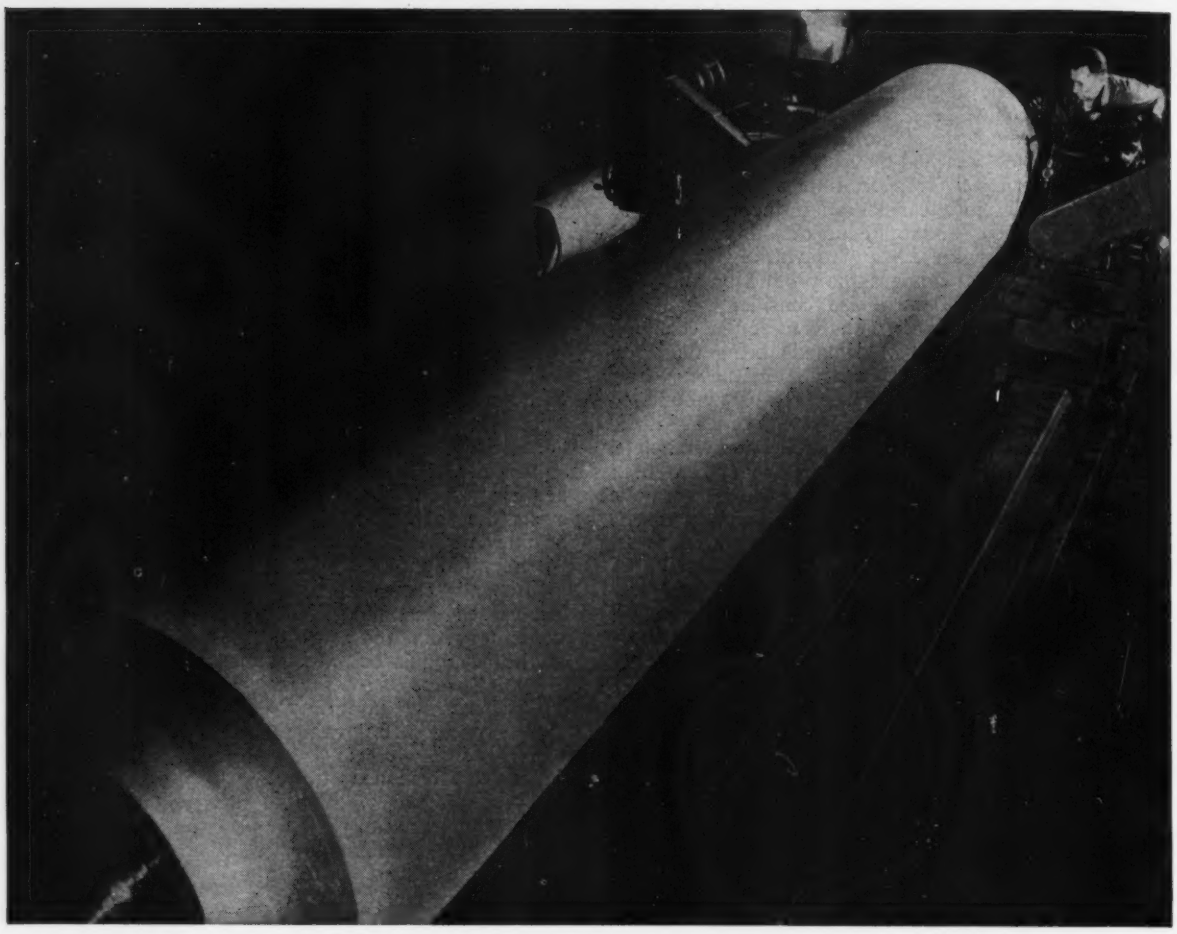
"I have discussed the matter of coated papers for lithography with a number of our people and we feel that an all purpose coated one and two sides sheet for offset lithography should be developed for our industry . . . not a sheet that can be used for letterpress printing as well and that will just get by for offset lithography, but a sheet that will not pick so that we get our full color value and good varnishing results. We believe this would be possible if the surface were sacrificed a little.

"Our experience has proven that the raw stock used is all important, not only with regard to pick but to varnishing qualities as well. We believe all the characteristics of a good varnishing uncoated label paper should be incorporated in the raw stock.

"We mean a cleaner, stronger sheet; the present body stocks are usually too weak. We feel that this stronger sheet would eliminate a lot of shrinkage in papers. Further, this would enable us to use stiffer inks and thereby obtain much better results in our lithography. This phase, of course, should be considered in cooperation with the ink industry.

"One of our chemists expresses himself on this subject as follows . . .

"Aside from the generally accepted requirements for lithographic coated stock—that it won't pick or curl or stretch and will still print—consistency or uniformity is very important. *This is true particularly in lithography because there is such a fine balance between the plate, ink, fountain acid and paper stock.* Gentlemen, there is a cogent paragraph



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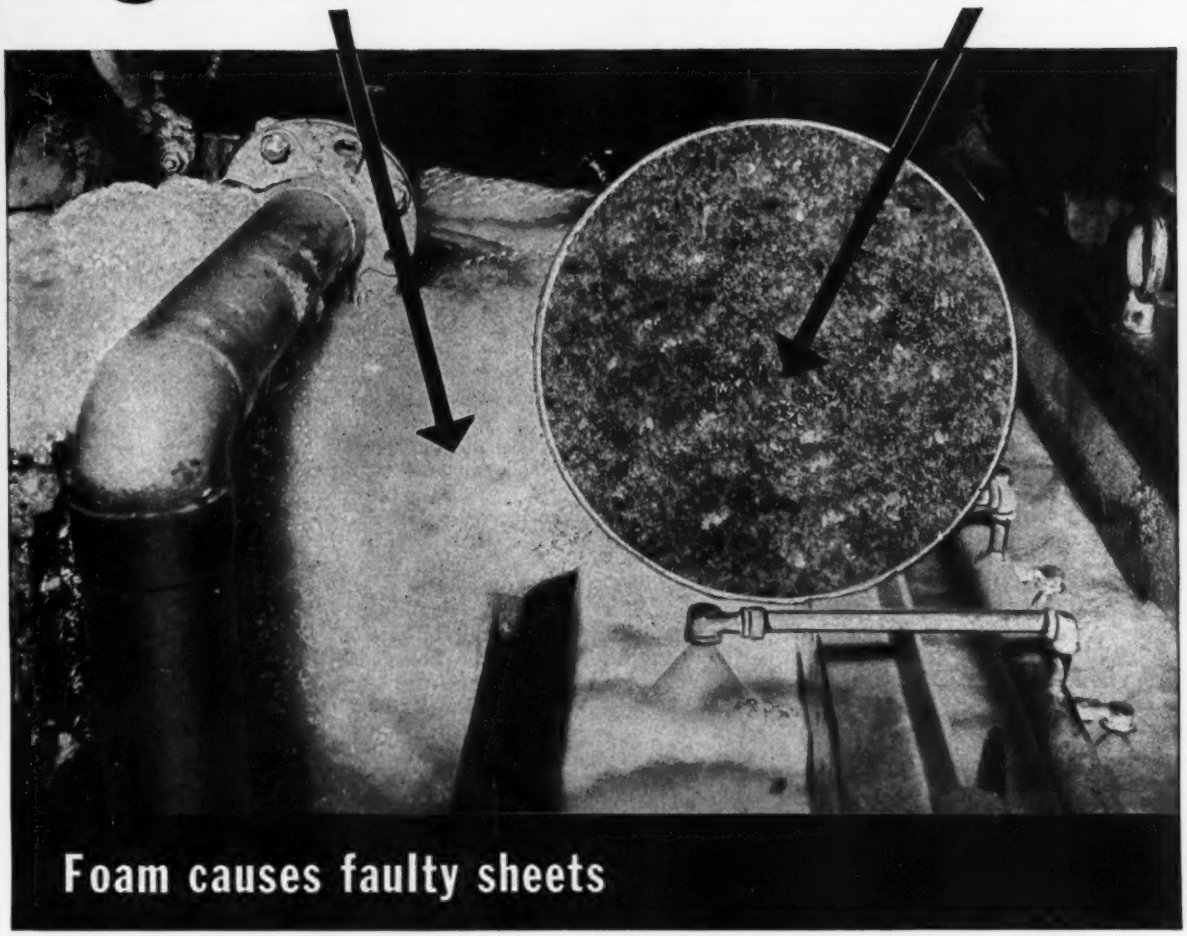

Foam causes faulty sheets

Failure to control foam in the head-box, cylinder vats, screen boxes, or on the wire jeopardizes paper quality through thin spots or faulty paper formation.

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everyone even thinking about lithographic production or papers should digest and it comes from a master craftsman.

"Sometimes," he continues, "we have noticed marked sheet-to-sheet differences both in printing and in varnishing coated stock. These differences in sheets can usually be traced to roll-to-roll differences in raw stock. An inferior roll of raw stock is coated and calendered and shuffled in with the better sheets by a multiple roll cutter.

"Sheet-to-sheet uniformity is more important than skid-to-skid uniformity, because a pressman can make slight adjustments from skid to skid but is stuck if differences are more frequent.

"We have also noticed considerable shipment-to-shipment differences in raw stock from the same supplier and marked supplier-to-supplier differences of supposedly the same grade of raw stock. This probably reflects present material shortages but may also be due to inefficient control.

"Manufacturers of offset coated stock will have to develop and use more effective control methods than they have in the past."

There appear to be some more constructive ideas and slants and some significant "beefs" in that letter.

Now I have known a number of the men I am quoting here for twenty years and have grown to know many of them more intimately in the past two years in this job of Executive Director of an endowed, scientific research and educational institution. Incidentally, I sometimes wonder how I ever got over from the buying and selling side into this job of combination Business Manager, Administrator, Fund Raiser, sometimes evangelist and crusader. You have to take the cloth, so to speak, in a job like this, and remember every day each one of your nearly 1600 members believes you are working for him alone. I have bought from many of these men into the hundreds of thousands of dollars of lithography, as a customer. I have sold for and with several of them into the hundreds of thousands of dollars of lithography. And I have been associated with many of them as a plant owner and competitor. Having personally made original photographs, developed the art and layout for creative selling, having shot the negatives and positives for reproduction and made the plates and run the press for letterpress, and I mean personally with my hands, gravure and lithography, I can say to you, in all sincerity, knowing these men and knowing their problems from a practical standpoint, customer standpoint, market standpoint, research standpoint, there appear to be some good conservative suggestions among these and sources for more. But they will never materialize unless there is closer cooperation and a sincere effort on the part of industrywise and private research and production men in the ink and paper fields serving lithography, as well as with the lithographic cooperative and private research and production men on the process itself. It must be a triumvirate.

Let me give you an example. We believe in the Lithographic Technical Foundation that we know as much about pH control and have published as good information as anybody and yet certainly less than 20% are pH control at all. In our new association with Armour Research Foundation with vastly improved facilities and available manpower of much broader scientific knowledge and experience, they have told me that we might as well stop work on pH in the lithographic process until it can be thoroughly coordinated with the pH of paper and of ink and all three closely related to the surface chemistry of the varying plate metals now being employed.

Already full discussion of our research projects and this one in particular has taken place with the ink research institute now getting under way on the ink manufacturers' problems as well as with some men from the private research laboratories of the companies not participating. You will find running through these suggestions from both so called practical and technical men (although both, of course, are practical) in the lithographic plants and in the laboratory constant reference to the pH of coated papers upsetting the applecart of the pH of fountain solutions on a lithographic press.

Let's take a look at another man's comments. This man I happen to know particularly well—has come up from the bottom and is in an important executive position with an open and curious mind, with a scientific bent. He gives us a list in the order of greatest importance of what they would like to have in their plant as they see it.

"1. A sheet of coated paper for Lithography with cost to compare with the machine coated papers used for Letterpress Printing.

"2. A surface coating that will not pick or pile on surface of blanket and then transfer to plate which causes the plate to counter etch and scum.

"3. A coated paper with a good white surface, this to be more to the Titanium Dioxide hue, not to the Pink, Blue or Gray side.

"4. A paper with a controlled moisture content to be packaged in moisture proof wrappers, so we who have air conditioned plants can open the skids of stock and run without reasoning.

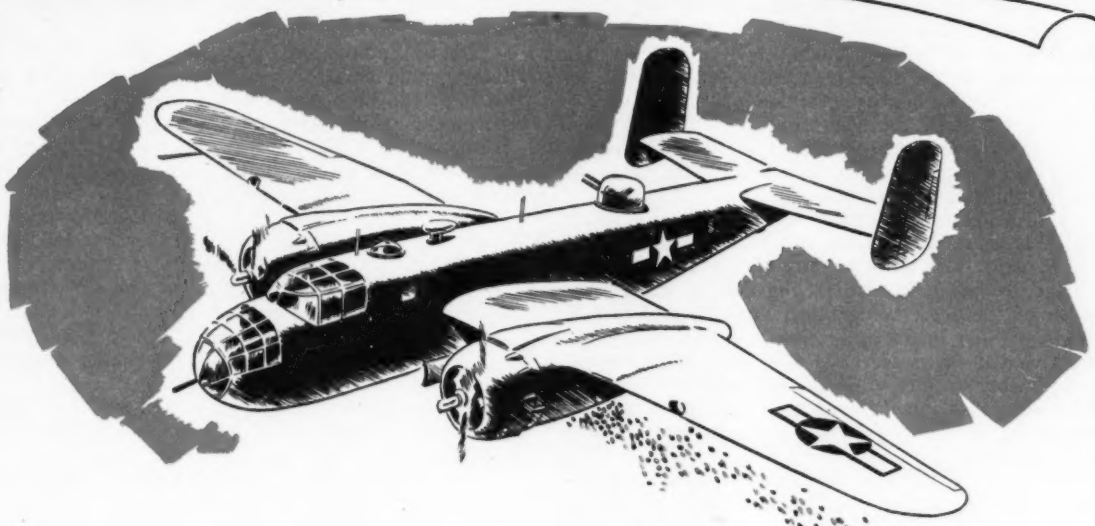
"5. The Formaldehyde Fumes should be blanked so that when the stock is opened and run or seasoned the smarting of ones eyes will not occur.

"6. A paper which is calendered properly and not too hard, burned or discolored.

"7. See if some sort of base can be used to eliminate the roll in the stock when the first color is printed. This would help eliminate the excessive offset problem we now have if our form happens to have solid or heavy bands of color running across the sheet in either direction.

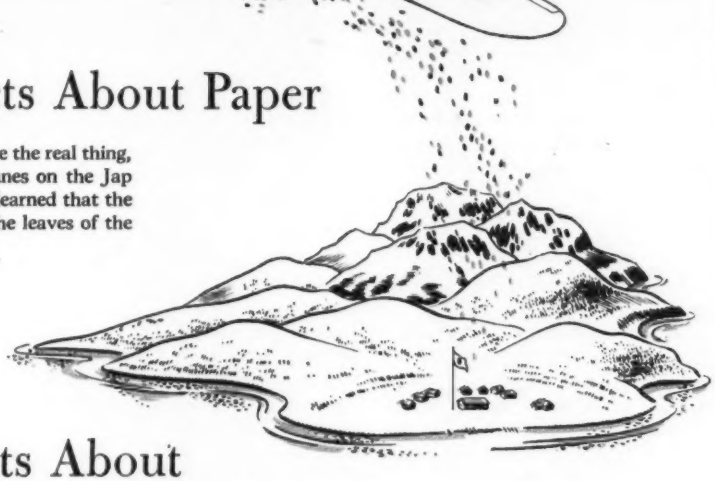
"8. A paper with a coating to be of such a nature that the ink will not be absorbed into the coating and thus cause the ink to dull or matt out and also in some cases cause a chalking condition. (Wade, he says,—*that's me*—sometimes this is caused by the pressman having trouble with water emulsifying in the ink. Then when this water logged ink is printed on the sheet the portions that are printed with the excess watered ink will no dry but the pigment will flake or roll off the coated stock. This same condition is also present in a regular sheet of paper but not to the great extent that it is in a coated sheet.)"

One of the larger lithographers reported that the difference in price between coated and offset seems to be far outweighed by the quality of the finished piece of lithography in relation to its brilliance and all around better appearance for special jobs. Yet, he reported that there was much difficulty in securing a supply of coated stock that could be run through the press without trouble. The trouble seemed mainly to be in the proper adherence of the coating to the body stock. This lack results in picking, tearing and fuzzing of the sheets or the necessity of reducing ink volume and brilliance in order not to lift the paper surface. Anything lighter than 70# was practically unusable except for light colors. This man felt that future developments in the use of coated papers in that particular plant depended very largely on better 60# coated paper primarily from the



Interesting Facts About Paper

Paper Kiri leaves, colored to look like the real thing, were dropped by American war planes on the Jap infested island of Attu when it was learned that the Japs believe death is inevitable if the leaves of the Kiri tree fall prematurely.



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standpoint of relatively new markets for them in mailing units where light weight was most important. He seemed to recognize the serious problem in the development of a body stock for this light weight paper that would provide a satisfactory basis for good surface and opacity, etc.

Here are some comments of another plant which happens to combine chemical engineering knowledge as well as a long record of practical production. Says one of the top men:

"In our plant, we do not run coated-one-side paper, which is a study in itself. Our main problems with coated stock are those of strength and dimentional change. It has been our feeling that because of so much of the sheet being taken up with coating, the length of fiber in the paper, itself, is most important. Most coated sheets we have used were short-fibered, and possibly because of the attendant lack of strength, dimensional changes are accentuated. On many occasions before starting a job, we run our coated paper through the presses with the laketine size. By doing this we give to the paper its proper stretch before the job is run. Correcting stretch and dimensional change in the midst of a job, as you know, is a very ticklish operation.

"Another difficulty we have encountered is the drying of inks on coated paper surfaces. Just why this should be we don't know, but we do find that a laketine size also helps the rapid drying of consecutive color put on the paper in quick rotation."

Another very practical production man makes these statements:

"Over a period of years we have only used one kind of coated paper which to some degree was developed to meet the conditions of our plant in that we operate a certain make of offset presses and have complete temperature and humidity control. We wish the mills might develop a better coating formula which would prevent the surface picking off and tearing away. This can be overcome somewhat by printing a shorter ink, but a modification of the ink formula sometimes affects the quality of the job. We have also had sheets which split under pressure. This looks like bad formation in the base stock.

"Offset Coated Two Sides has always been somewhat of a problem, particularly where large surfaces of ink are applied. We are in hopes that the paper mills will develop a coated two sides' sheet which will enable the lithographer to maintain standard production without the use of special quick drying apparatus."

Now, in all instances, I asked the lithographers to confine their suggestions to things you could do to improve papers to meet the needs of the present and future markets of the lithographic industry and to put themselves in the position of having to stand up here and tell you what they thought. Yet, strangely enough, three of them, without prompting bring in the Lithographic Technical Foundation and the part it can play in cooperation with your research and production men in the industry.

Here's one from a man who was long a practical paper maker but who has been in an executive and production position in the lithographic industry for considerable time:

"1. Lithographic Technical Foundation should be placed in a position so they can analyze conditions in numerous litho plants and make specific recommendations to member paper mills regarding trends in paper requirements.

"Reports from the Lithographic Technical Foundation should (and I add could) be more valuable in guiding the mill than individual reports from individual lithographers picked up by paper salesmen and jobbers. (I might also add under pressure of individual job complaints).

"2. The Foundation could keep mills informed of contemplated changes and trends in equipment and techniques in litho plants and in labeling and binding equipment which might affect paper requirements. (Proposed 54"x76" 4 color press). This type of information gotten to mills as soon as possible would keep mills ahead of changes.

"3. The Foundation could guide member mills in producing papers which will give best overall press production.

a. Strength—requirements to permit highest press speed.

b. Curl—development of C.I.S. papers which will give minimum curl tendency under all press and labeling conditions.

c. Development of papers which will hold register and not crack on 4 color presses without conditioning.

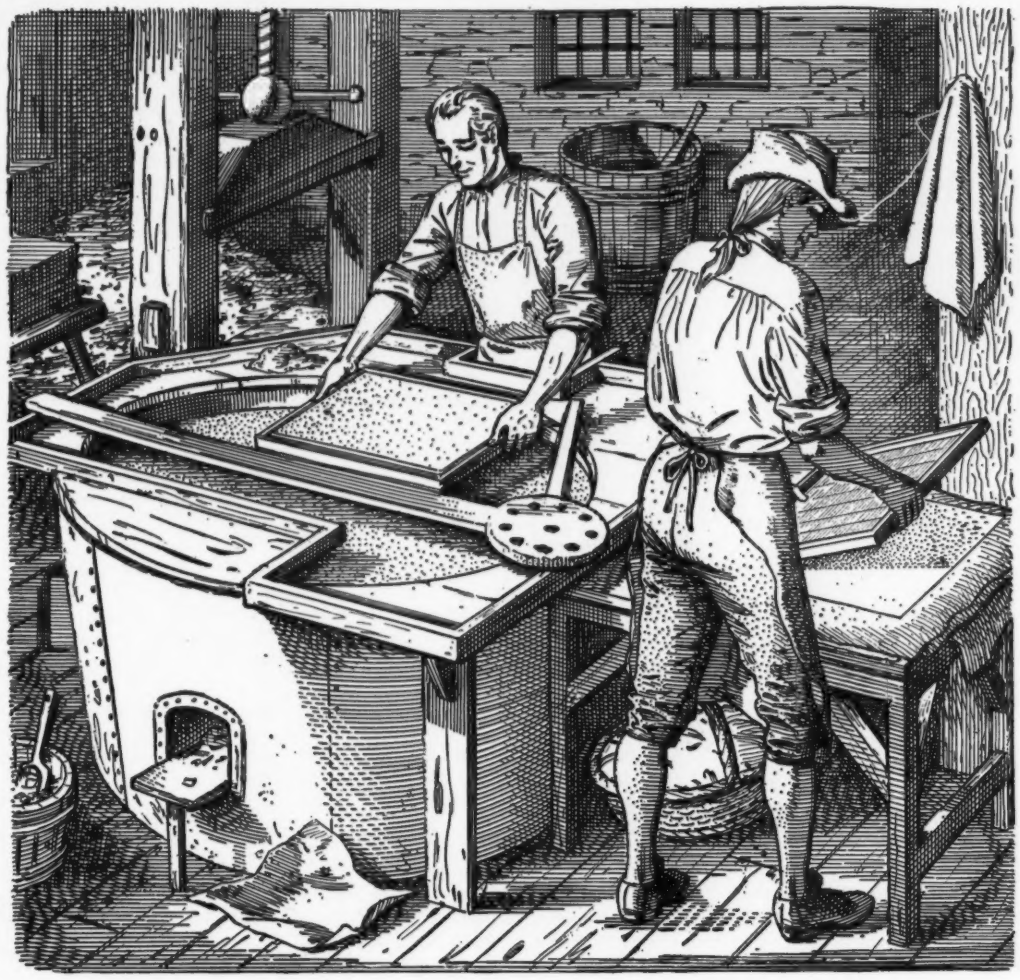
"4. Possibly coatings which are less water absorbent.

d. *Incorporation of ingredients in coatings which will increase drying of inks, prevent winding and handling."*

I must admit that while we make a substantial effort to do most of the things that this gentleman suggests, we are without funds to perform all of those services as well as we should and as well as we do perform some others that are demanded of us by members.

Now there was no questioning of facts in these letters that over the period of the past twenty-two years the Lithographic Technical Foundation has made very real contributions to the improvement of the process, techniques, equipment and to the improvement of supplies and materials, especially paper. It would be very difficult to convince a substantial number of our more than 700 lithographic plant members and more than 800 individual key plant men members, as well as 225 supplier members, that the work done at the Bureau of Standards, and in which you had a stake and a part, did not have a very substantial effect on the development and improvement of papers for lithography and improvements in the knowledge of the handling of papers. Nor could you convince them from the record that the job cost less than $100,000 or that the paper industry actually paid any larger proportion of it than their share in even lithographic dollar. You'll find many lithographers who will say the improvements in litho papers directly resulting from that Lithographic Technical Foundation initiated research were worth to lithographer and paper maker the cost of the the whole L.T.F. research program for 20 years.

The work on rubber blankets and their 200% improvement as the direct result of research work at the Technical Foundation is another case in point as is the work on pH and the deep-etch process, the albumin process, on the relation of dot area to dot density in the process, densitometric measurements as a means of tone control. In fact, the whole ten year program of tone control, including contact screen work. And now the development of cellulose gum as a substitute for gum arabic as shown on exhibit here and covered in a folder just going out to members. (Copies of this are here). In the interest of time, I am not going to read off all the advantages of cellulose gum. I recommend you do. It opens up a whole new field of possibilities for improvement in coatings and fountain solutions. Already a spectacular new Fountain Solution is on



Sheets of Precious Paper — One by One

For nearly eighteen centuries after the discovery of the paper-making process, paper was laboriously made by hand. The craft required inordinate skill to keep the sheets uniform. As the vatman dipped his mould into the pulp, then lifted it to let the excess water drain between the wires, he gave the mould a two-way shake to make the fibres intertwine. Then the layer of wet pulp was shifted to a papermaker's felt, a thick square of woolen cloth. These felts served a triple purpose: They couched the sheet from the mould, they lapped up the water, they imparted a finish to the surface of the paper.

Today, on the modern paper-making machine, those squares of cloth have become giant, specially designed, swiftly running belts of woven wool. Through all the long history of paper-making, nothing else has been found which serves this essential purpose.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

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trial at the laboratory that will have direct effect on the application of ink to paper lithographically. The work on the measuring of depth of grain, its size, its wettability and the development of standard specifications for the metals themselves and simple means of specifying how to produce uniform grain are important to you. All this grain and moisture control study accompanied by investigations in 13 different directions, not only on zinc and aluminum mechanically, chemically and electrolytically grained plates, but also bi-metallic of various kinds is important to you. And such matters as the improvement in the Cronak process, development of the schedule of exposure times in relation to varying humidities. In fact all these directions lithographic research is taking are tending toward the reduction of paper problems and complaints and the best possible handling of the improved papers which you are going to give the industry. One of the first things that the research men at Armour Research Foundation told us after a year's association on four projects only was that research in lithography must proceed simultaneously in the different steps of the process—in photography, in plate making, in press operation, in order that they not get out of balance. I might add that their thinking extends to ink, paper, and other supplies. This is because, in fact, today lithography remains essentially the one linked chemical process from negative to finished sheet. Help in obtaining good reproductions comes so largely from chemical procedures rather than mechanical. Let's take a look at one or two of these simple and distinctive differences because, as lithography has grown from an art to a craft to a manufacturing utility with all the attendant adjustment of skills, techniques and materials, the changes have been brought on by science and scientific procedures to meet customer demand.

Bringing this line of thinking down to shop practice: first of all, where wide ranges of tone are involved as in halftone reproduction, the negatives and positives should be substantially the same value, tone range and contrast as the final reproduction, not flattened to accommodate mechanical corrections. This is because there is so little that can be done mechanically on the plate or by make-ready or wide variations in mechanical pressure on the press to correct tone ranges or intensities. Generally speaking, tone control and correction are achieved by hand retouching, staining, opaquing or chemical dot etching, the last with due regard to the significance of dot density as well as dot area and to their interrelationship.

Peculiar to the lithographic process is the conscious or unconscious pressure on each skilled craftsman concerned with the steps of procedure on the same job all the way from the shooting of the negative to the delivery of the finished sheet. He is constantly reminded that he is dealing with a large plate area. More often than not it is made up of small units, some repeat and some varying. All are on the same plane surface. And the individual units or areas cannot be altered or made ready substantially. Each lithographic craftsman in the team has to realize too that press reproduction is more apt to be true to the original negatives or positives than hand proofs, yet more often than not, hand proofs are presented for customers' OK. Two of the most common reasons for not using a press proof arise from the fact that the hand proof often reflects the individual interpretation of the prover in the way he rolls up certain plate areas and fans the plate dry before proving, also in the fact that the proof press blanket does not have the opportunity in the limited number of impressions to work into the job. Often, too, the press picks up dots that do not even show on the hand proof. I'll bet you've heard of the paper being blamed for that. We have. Then, take deep-etch plates, for example. They are generally made with the dot size 15% or 20 % less than for proof plates to allow for this difference. The quality relation of proof to press production is the reverse of letterpress printing—and brings on talk and complaints.

Add to all these special considerations the problems of uniform grain, coating and sensitizing such large areas as 54"x76", avoiding mechanical wear on plates, maintaining a planographic image, keeping proper pH control of fountain solutions. They do seem to represent a lot of special angles that need cooperation and coordination throughout the plant and with suppliers. Conditioning of paper, temperature and humidity control, more accurate measurement and standardization of solutions, extreme cleanliness and *close cooperation between photographers, tone and color correctionists, plate makers and pressmen pay bigger dividends in lithography.* Yet, even where the best art work only is accepted normally, where good negatives and positives are shot, where good stripping and layout are done, where good albumin or deep-etch plates are made, where work is run on good presses, with good inks, properly adjusted fountain solutions, pressures, etc., trouble does develop and in that last moment, when the pressman stands at the delivery, pulls off a press sheet and goes over to inspection table holding a paper in his hand.

If something has gone wrong, almost telepathically the idea of blaming the paper flashes into his mind. And logically or psychologically, it is unnatural that a pressman should mentally or from knowledge and experience go clear back to a too flat negative that may have been the fault in this *linked chemical process.* Being convinced in time that it is not the fault of the paper, if it isn't, he may go back to the ink. Then, being convinced that it is not there, look into the situation of fountain solutions and then the plate and then get in an argument with the platemaking, point suspicion at the positive and then the negative and maybe he and his teammates and superintendent find it clear back in the art work after all.

All of this seems to say that the lithographers and suppliers who conceived this lithographic Technical Foundation in 1921 had what you call practical imagination and foresight. High speed offset presses were still 7 years away but coming. They decided as early as 1921 that for this industry research and scientific procedures and more knowledge of the process might be able to do what they had done for the electrical, chemical, steel and automotive industries. They also saw that the problems of the lithographer and supplier in this industry which revolves around a linked chemical process then as they are now were inseparable. And in the case of pH control where the pH of the paper and the ink and the fountain solutions are so inter-related, yet researched upon independently at present, and all three so related to the surface chemistry of the metal, there can be no denying the fact of the need for close cooperation. But let's go back and read another letter of one of the lithographers' suggestion.

"Of all grades of paper," he says, "we think that coated paper has slipped the most. The coatings are too soft and therefore pick and peel off entirely. We also note that after printing one color, especially if it is close to a solid, the coating seems to swell and distorts the sheet. We also note that the paper is constantly changing shape. Most of it seems to stretch and fan out, but we have experienced the re-

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verse of that, where the paper has shrunk in size. We always keep coated paper covered in our pressroom in spite of the fact that it is air conditioned, but it has also been noted that coated paper curls and wrinkles more readily than offset paper.

"Coated 2 Sides paper we think has too much coating on it, or else hasn't got sufficiently strong body stock. After one or two colors are printed on it, it gets such a wave in it that we can't get the air in between the sheets in order to have the feeders properly operate. If you do get sufficient air, the sheet waves so much that it is moving while the suckers have hold of it, or pulls out of the suckers and goes down the tapes slightly on the bias and causes the press to trip. This, of course, causes delay and color variations through the edition."

One of the plants well known to all of you with a practical lithographer as the owner who also has considerable chemical and research background starts right off with this statement:

"I believe you should stress the emphasis placed by the Foundation on a scientific approach to our various problems among which paper is so prominent. This scientific approach in our industry is necessary if the technical advances in the paper industry is to be made use of to the fullest possible advantage.

"I might emphasize here the better understanding fostered by the Foundation of the relationship between moisture content of paper and performance; the advantages of humidity control in the pressroom; economy of operation when these controls are adopted, etc.

"I would also stress the interest of the Foundation in bringing within our industry properly qualified technicians of professional competence so that our industry will complement the work done by their technicians. For as you know, it makes a big difference if paper mills have the proper cooperation from large users of paper, and no permanent improvement can surpass success in this direction by the Foundation.

"With regard to trends in our demands for paper with special reference to coated stock, I can only speak for the specialized field covered by our business, namely, principally the canned goods label field.

"In this field the crying need is for a paper of sufficient opacity to do the job that coated one side paper does, leaving all other properties unchanged. In other words, the paper must take inks and varnish without undue absorption; it must not lose its squareness in large sizes; it must not wrinkle; the proper degree of whiteness must be maintained, etc., and finally the price must be right."

One lithographer comparatively new to the industry, very active and progressive and a relatively new member of the Foundation happens to have a well qualified research man in his employ who has also worked in ink, lithographic, photo chemical and supply laboratories. Instead of answering our questions direct about word to be given you on improvements you can make or directions you can take, he has submitted the following which has a great deal to do with the Lithographic Technical Foundation's position in the picture, but I think you may find it interesting.

"One of the greatest contributions of the Lithographic Technical Foundation during its first twenty years of activity was its work on paper. This work, although it did not receive the publicity it deserved, formed the basis for the specification of many of the air-conditioned plants of today. Lithographers, as had other printers, had known the effects of moisture on paper, but the degree to which these affected the printed job were not know, nor were methods of preventing much of the trouble.

"The cooperation of the paper mills in applying these results should substantiate any questions concerning the value of this work. To many lithographers the dollar and cents value of pre-conditioned paper has been enough to more than offset the cost of the research on which this method of handling paper is based.

"To be sure, a good part of the paper research program was wasted for want of technical men in the lithographic industry who were able to interpret the results of these findings, but the industry is becoming more conscious of the value of such men in plants. Where shops maintained their own laboratories the proper use of the data made available and the instruments which the Foundation developed, greatly aided in preventing much spoilage and lost time.

"A large part of the information such as fiber length, beating time, etc., was of no value to the lithographer, and how much of these data were used in improving offset papers is not generally known among lithographers. Certainly there were many improvements in the years immediately preceding the war, but the mills never stated whether they resulted from their own private research or that of the Foundation sponsored Bureau of Standards program.

"Perhaps the greatest difficulty in any research or advancement in the graphic arts is the lack of co-ordination between the various supply trades. This applies to both letter-press and lithography but more especially to lithography since more supplies are required. Too frequently suppliers come forward with new ideas without giving any consideration to what changes in materials, technique or equipment are necessary to make the use of this idea practicable. Many useful improvements have gone by the board and much money wasted because suppliers attempted to work independently of the rest of the industry.

"One of the last pre-war projects undertaken at the University of Cincinnati under the sponsorship of an ink company showed that there was a definite relationship between the chemical composition of the coating on paper and the speed with which ink dries. Ordinarily a paper company would not undertake a project involving a study of both ink and paper such as this, and it would require a very complete knowledge of the lithographic process to determine if the best ink-paper relationship could be run in routine shop production. It is in projects like this where the interests of several different groups of suppliers are involved that the coordinated research of the Lithographic Technical Foundation is most valuable. There are many such problems to be solved, and many cannot be solved at all until there is a more complete understanding of the process itself.

"General problems relating to the manufacture of paper with certain properties should not be undertaken with Foundation manpower or equipment, but research and investigation to determine what properties are necessary for best results in the lithographic process should only be undertaken through an organization such as the Foundation."

Now here is the last excerpt from letters selected:

"Replying to your letter of May 28th, I have talked with various men around the plant relative to paper research, having in mind particularly, coated paper, as you suggest. Their suggestions fall into two groups: research to cure recurrent faults; research directed toward an improved paper for lithographing purposes.

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"In the first category fall such difficulties as are listed below.

"Curling of coated paper toward the coated side with its axis the long way of the paper—parallel to the gripper, is one such difficulty. This is not always helped by conditioning and the tendency to curl sometimes increases with each passage of the paper through the press. Thin stocks show a greater tendency to curl than heavier stocks. On the other hand, many coated stocks, both thin and thick, give no trouble from curling, showing that it can be done.

"Drying of inks on a coated stock is more of a problem than on uncoated stocks. That this is due to ink vehicle going into the coating is indicated by the fact that a second color printed on top of a previously printed color, dries better than the same color printed on coated stock alone.

"Lifting of ink on coated stocks is much more of a problem than the lifting of ink on uncoated stocks.

"Wavy edges, even after conditioning, cause trouble with misregister and creases.

"Expansion of the stock, particularly along the back edge, is a common source of trouble, but a worse source of trouble is where this factor varies in a pile or from pile to pile because press adjustments made to meet this condition at the start, cannot be changed without increasing the trouble.

"Picking of surface is a source of trouble but this is more of a problem on uncoated stocks than on coated stock.

"In the second category, research should be directed toward the making of a paper especially adapted to lithography without necessarily increasing the price range. Factors to be considered in this category should include the following.

"The clean and sharp lifting of ink from the blanket—tied up, of course, with co-operative blanket research.

"The paper should allow the ink to dry without offset on the next sheet and to dry with the minimum change in color from the shade as first printed involving co-operative research with ink manufacturers.

"The paper should work well on automatic feeders.

"It should lay flat in the delivery pile.

"It should show minimum expansion to press moisture.

"It should show uniform response, one sheet after another, to press conditions and adjustments.

"Research with the object of overcoming some of these factors or at least minimizing and standardizing them, will be a big help to the lithographer."

The selected excerpts I have inserted in this paper are taken from a 100% response to my inquiry.

They make up a reasonable sample cross section of opinion of something like ⅓ of the dollar volume of the industry.

Tabulation is impractical because no formal questionnaire was submitted and the individual responses do not therefore necessarily cover all complaints or suggestions for improvement. They do however have all the weight and values of confidential correspondence uneffected by leading questions, fear of identification or pressure of current individual job complaints.

Such a cross section obviously does not reflect conditions a year ago or a year from now. It may give you an idea of what can be done statistically or otherwise at any time.

If you accept the information on that basis and for what its worth, here is how all the replies summarize as to complaints and constructive suggestions, not necessarily in the order of their importance:

1. *Complaints*

Insufficient resistance to Picking and Pealing.
Tendency to Curling
Tendency to tearing out.
Irregular effect on drying of Inks causes lifting of ink.
Too great dimensional changes.
Tendency to wavy edges.
Lack of sheet to sheet uniformity.
Wide variations in moisture content.
Minimum weight limit too high for mailing requirements.
Wide variation in ink receptivity.
Interferences with pH control.
Weak body stocks.
Insufficient opacity in light weights.
Insufficient whiteness.
Splitting and cracking.
Some coatings too water absorbent.
Generally slow down press production.

2. *Suggestions*

1. Research should be directed toward the making of a coated paper especially adapted to lithography without necessarily increasing the price range—one and two side coated.

2. Such a sheet or sheets should have these standard characteristics: Adherence of the coating to the base stock of all press speeds. Sufficient strength in base stock to feed and handle at all press speeds.

Dimensional stability.

Minimum effect from press moisture.

Uniform response one sheet after another to press conditions and adjustments.

Clean and sharp lifting of ink from the blanket achieved by cooperative blanket research with Lithographic Technical Foundation.

Allow ink to dry without offset on the next sheet and to dry with minimum change in color from the shade as first printed achieved by cooperative research with ink institute and manufacturers and Lithographic Technical Foundation.

Have minimum effect on pH of Fountain solution and images achieved by cooperation with Lithographic Technical Foundation and Ink Institute research on pH control.

Uniform ink receptivity—achieved by cooperative research with Ink,

A through and through sheet with all the above characteristics.

I fully realize most of these complaints and suggestions are known to most of you.

But I doubt, from my conversations with some of you, if you are sufficiently impressed with the urgency of the demand, the possibilities for tonnage increase through new business rather than conversion from other processes, and the sound reasons for insistance by lithographers that especially developed papers are inherently necessary for this linked chemical process to realize on expansion opportunities.

We on the staff don't care who does the research as long as it is done.

We don't care about activity for activity's sake.

We are not impressed with ideas of work conceived in order to obtain credit and have no false pride of authorship or need for it in this reorganized set-up. Our research men are not under pressure to develop patents from which royalties accrue as a means of raising funds and insuring their salaries and security. Funds will be raised by straightforward methods in accordance with the needs and opportunities of the industry. We are fighting hard to

SPECIFICATIONS CAN CAUSE "LOG JAMS" IN PAPER PRODUCTION, TOO

Figuring specifications on the many new paper products today can throw a heavy burden on paper plant technicians and superintendents. Hours, even days, may be wasted—at a time when you can least afford it. And the research you do may have been done already by some one else

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increase the proportion of fundamental research as compared to advance trouble shooting.

We are straining every dollar to produce increased research result, step up employee training, increase and improve informational technical and plant services. The ratio of administrative overhead has been cut 50%. We do have the manpower and facilities and access to the best informed opinion in the industry to develop surveys and suggest the standards and characteristic. I think this is demonstrated by the 100% response to my request for a quick cross-section sample of information presented here.

That sample can be refined and projected promptly and made continuing at any time. Dr. Frost, and other members of our paper advisory committee, when it met at the time of the Tappi meeting last February suggested "That the best thing the Lithographic Technical Foundation could do toward further improvement of paper would be to draw up specifications for ideal litho paper, and that the Foundation could help by making a survey of commercial litho papers and rating each for desirable lithographic characteristics under certain standard conditions." We can do just that and more, if required and if funds are available.

We do not have the facilities for conducting paper research and there is no ambition or desire to invest precious research money duplicating equipment unless it becomes necessary. If you'll pardon my saying so gentlemen, the fact that paper mills have contributed only $15,000 to endowment out of a quota of $100,000 in the past two years and less than $2,000 out of a quota of $25,000 Annual Memberships providing a total of less than one per cent of the Lithographic Technical Foundation annual budget for useful research and other activities is not right and is a matter of concern to our officers and directors, and to me. We are less concerned with the facts than with reasons and motive.

We lived on an insignificant income from endowment for twenty years and did more work for less money than almost any cooperative industry organization in the world.

We have recently raised the endowment from $452,000 to $1,000,000 and raised annual memberships to $100,000.

On the basis of anticipated income, we have a $150,000 budget this year for all activities, research, employee training which with the G. I. situation is heavy, technical plant service, plant problems referred to the laboratory, abstracting service and field educational service.

We have active officers, directors and committees.

Yes, policies, manpower and facilities that square with the needs and opportunities of the times and the future of the litho industry are available. If you accept the philosophies that the problems of the lithographer and supplier are inseparable and indifferent as to this linked chemical process and that manufacturers should do their own research after needs, standards and directions are agreed upon, then paper mills and jobbers will be making a mighty fine investment.

The idea that the Lithographic Technical Foundation research is to be regarded by paper mills as customers' research and therefore should not be supported by paper mills and jobbers is unadulterated applesauce.

This institution is not a lithographers' organization—a customers' organization. It is the organization for the lithographic process, unique among graphic arts organizations in the world. It does not perform the functions of trade relations or development, tariffs, legislation and labor relations matters that are adequately covered by associations. It is entirely independent with no affiliations with any association or group. It does not admit groups or associations to membership.

Lithographers being direct interpreters of the needs of manufacturers of consumer goods for lithographing on paper to develop their markets are your representatives to your inaccessible ultimate customers. They seldom deal through advertising agencies, magazines or newspaper publishers because they make by far the majority of their own plates or they are made for them and not the customer. And paper is something like 25% to 40% of any lithographic job. (Show here the inseparability chart).

Look, too, at the roster of Lithographic Technical Foundation officers and directors. Every type of supplier is represented. So are they on our research committee where they have full knowledge of our work and a voice in shaping the programs without the necessity of telling us what they are doing in private research unless they so elect.

(Show here a blow up of the roster of LTF officers and directors).

Certainly Lithographic Technical Foundation's members include lithographers, large, small, and medium, straight and mixed plants—700 of them, representing over 80% of the dollar volume of lithography—250 suppliers—and 750 individual key plant men among lithographers, ink makers, paper manufacturers, chemical and photo supply equipment and machinery, with over 50 foreign members in countries all over the world. Sixteen hundred members in all.

It carries on cooperative and combined research and stimulates private and related industry research to improve the process and remove human variables, reduce waste, increase press production, etc.

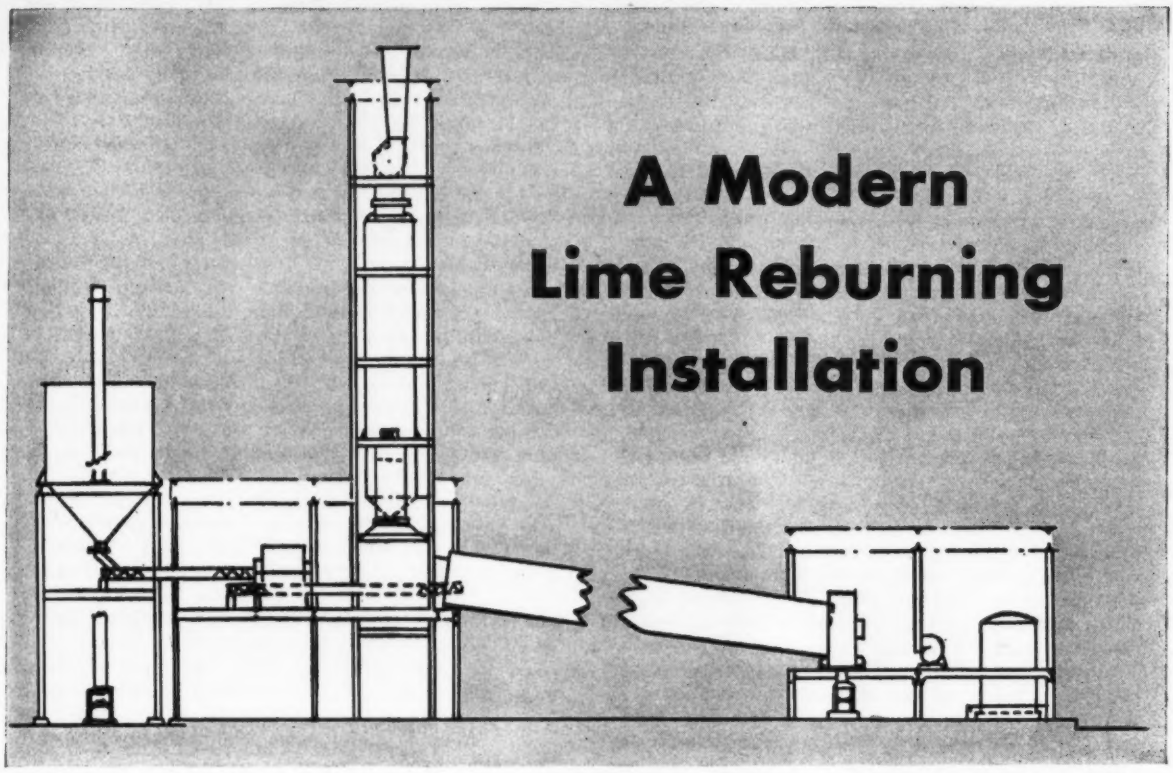
And it does something substantial about disseminating information and training and upgrading skilled craftsmen as you can see from the 96 publications and 21 training courses, both skilled craft and junior executive exhibited in this room. It can and should do more. As one lithographer puts it, a $150,000 budget is a drop in the bucket of what lithographers and their suppliers would economically invest in LTF cooperative research and employee training alone if they were made to see sufficient evidence of ability to produce results and were told the real needs.

Incidentally, education on the use and handling of paper is a top subject in our educational program and has much to do with better use of paper and reduction of complaints. The information dominates more than 10% of our publications—more than any other single subject. Perhaps that is why paper jobbers are currently supporting Lithographic Technical Foundation programs to a greater extent than paper mills—or perhaps why ink makers who get only 10 to 15% of lithographic dollars are supporting the programs 2 to 1 over paper mills.

This is the kind of an institution hardest to put together because the industry has grown from an art to a craft to a manufacturing utility requiring the services of science and research. It did not stem from modern sciences, as did the chemical, electrical and automotive industries.

Listen to what Dr. Jewett, President, National Academy of Sciences, said on the subject at the opening of the new Sugar Research Foundation regarding setting up cooperative programs, such as our own.

"One of the first things that I noticed in the early days of my career in industrial research was that it was very much easier to bring the tools and methods



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of fundamental science, as exemplified in the laboratories of Universities, Technical Schools, Foundations and what not, to the assistance of industries which had developed out of modern science than it was to industries which were old in human history—that is, to industries which had grown out of ancient arts.

"If you will look back you will find that the first great industrial research laboratories were in the fields of modern chemistry or of physics primarily, as exemplified in the electrical industries. In other words, in those industries which in effect grew out of Laboratory work rather than out of art as slowly developed through human experience. Also you will find that generally speaking those industries which are oldest in human affairs and whose methods have evolved slowly from their beginnings in prehistoric times were slowest and most conservative when it came to adopting the methods of the newer science.

"True, they rather early adopted some of the elementary tools of science for check and control of processes. Likewise they were not slow to employ technology for labor-saving purposes and as a means of lowering costs. But as for using science largely as a primary tool, they have been slow despite the fact that potentially they have the most to gain since, because they deal with man's primary wants, they are concerned with his principal activities.

"While it is a curious phenomena, it is not a surprising one when we stop to think of man's conservative tendency to cling to the pattern of his past experience. The more each new generation is schooled mainly by apprenticeship to the preceding one, the more conservative will it be."

And here is some testimony of Dr. Vannevar Bush of OSRD:

"It should be kept in mind that what may be duplication and inefficiency in normal business affairs may be the essence of progress in science. It would be a mistake to apply to the administration of science the concepts of administration developed by commerce or for military organization, or for the operative agencies of the Government. Science should be administered in the way which scientists have discovered through decades of experience to be the most productive of results."

And here are the views of Dr. Norman A. Shepard of American Cyanamid Company as printed in THE NEW YORK TIMES of February 19th:

"Accountants and management should make certain that their laboratories are provided with sufficient funds during "these profitable years" so that when competition again becomes acute such laboratories will be in a position to lower costs and increase the quality of existing products as well as have new products ready, it was emphasized last night by Dr. Norman A. Shepard, chemical director, American Cyanamid Company. He spoke at a meeting of the New York Chapter of the National Association of Cost Accounts in the Hotel New Yorker.

"Dr. Shepard decried the feeling which exists between accounts and research people and urged that the former establish closer relationships with their laboratories and their personnel. The research man, he emphasized, must not have his style and enthusiasm cramped by being held too closely to commercial considerations and many researchers are not as extravagant 'as you may think.'

"Acknowledging that one of the accountant's prime duties is to save money, Dr. Shepard pointed out that any cost accounts and budget men believe it sound policy to buck every unusual expenditure on the theory that all research people are extravagant and the only way to bring them to their senses is to say 'No' right away to every request. This attitude, he said, is responsible for the tendency of a research man to ask for much more than he really needs.

"If both parties in the 'scientist-account fund, if it can be called that', he said, would honestly try to get the other fellow's viewpoint, there soon would be no real misunderstanding.

"One successful method of accomplishing accord, he said, can be achieved by having engineers and chemists on the staff of the directors of budget, as is the case of Cynamid. These men not only investigate the soundness of budget requests and projects, but also alleviate and explain the shocks to which most cost people are subjected by the scientist, he pointed out.

" 'Unfortunately', Dr. Shepard continued, 'you cannot lay your money on the line and know that you can get value received and at a scheduled time. You only know that, over a period of years, you will get your money back and more."

I hope you will put in this aside to our own officers and directors. One of our greatest problems and yours is to reconcile the points of view of the financial and bookkeeping mind to the fact that research results cannot be scheduled and forced nor can they always be made to show as tangibles in three-column entry bookkeeping.

So you men of faith in research and technical knowledge must help make it plain to your principles and we to ours that the cooperative research and services of this institution on the lithographic process and related materials has for twenty years benefited lithographers and suppliers. The Lithographic Technical Foundation cannot and does not take credit for the advancement of lithography from a $75,000,000 business to a $300,000,000 in the past 22 years although the industry has so advanced and largely through entirely new types of business. But that advance and the existence of the Lithographic Technical Foundation are more than coincidental. The continuation and development of the Lithographic Technical Foundation is the strongest possible testimony to the separateness of the industry, the distinctive nature and requirements of the process.

No part of our membership has received more benefit from Lithographic Technical Foundation research, employee training, cooperation and other services than the paper industry, directly and indirectly. That is not my opinion alone. I have checked it again very recently with many lithographers and suppliers. It is referred to voluntarily and vehementaly in the responses to the inquiries for information reported to you here. It is a reason why the majority of our members and other suppliers supporting the Foundation with a budget of $150,000. Incidentally that is the equivalent of 3% on $5,000,000 annually whereas we have only a million dollars endowment. And in the old days we lived almost entirely on income from endowment which never exceeded $750,000. The budget is ten times the average from 1924 to 1932, and approaches the real need especially on research services, the educational activities and services are being made self-supporting rapidly. I am quite sure there is no question in your mind about the value and quality of the work done by the Lithographic Technical Foundation in the past 22 years and its contributions to the advancement of the process. If there are any questions in your mind as to the quantity, I ask you in all fairness, how much has your own industry done or any private research laboratory with an average of less than $15,000 a year for research including salaries of your research director and men.

There are included in the above observations reasons why supporting members, both lithographers and suppliers, cannot understand the recent attitude of paper mills in not supporting the Lithographic Technical Foundation programs to anything like the extent they did twenty years ago or the extent of their proportional participation in lithographic dollar volume or benefits from the research and employee training and technical plant and informational services of the Foundation. I am aware of the division between process research and mill research for ink or paper. I am aware of the employers' attitudes on government research. And being an employers' organization, believe we see eye to eye with paper mill ownership. I am not suggesting we do paper research. I am suggesting that because of the peculiar linked chemical nature of the lithographic process, the problems of lithographers and suppliers are inseparable and should be mutually attacked and solved —which means the programs should be mutually supported.

The paper industry should fully support its own industry research first, of course, and its private research and actual research be done under its supervision.

And it should not put one cent in this institution's research and employee training programs as a favor to customers for sales promotional effect or fear of threats or reprisal—not one cent unless it expects to get and to continue to get real benefit from all the cooperative research and educational activities and services that it cannot get from its own industry or private go-it-alone research and educational activities in this separate and distinctive linked chemical process—magazine, newspaper, letterpress or union opinion or pressure notwithstanding.

It is time we called a spade a spade. One of you recently wrote me in answer to a suggestion from one of your own group that he support the work of the Lithographic Technical Foundation to the extent of $100 annual members. You opined the lithographers and the Foundation were ill advised in not pitching in the Foundation's research and educational lot with an overall graphic arts set-up. To you, I say "nuts." Lithographers have nothing to do with it. Senefelder cast the dye 150 years ago when he developed a reproduction art, based on chemical and physical principles known then and that have altered only in detail and, of necessity, only as new uses for the process grew and the process itself became first a craft and then a manufacturing utility verging on line production—a process where negatives and positives have different contrast of necessity, where color and tone correction is by chemical means, where coatings and images are different, where plates are grained and moisture involved and etching doesn't mean etching, where effects of temperature and humidity are more important, where tooling, re-etching and help from make-ready and pressures are inconsequential, in fact, where press pressure is a kiss, not a crush.

Lithographers and their closely related suppliers in this institution are not stand-offish because they are a different kind of people. Again I say, more than half of our members are mixed plants and the largest lithographer does more letterpress than offset.

But when it comes to process the lithographer is made acutely aware that his problems are different and to quote on you all respect, this is because "there is such a fine balance between plate, ink, fountain acid and paper stock." He doesn't want paper jammed down his throat as good enough for average commercial delivery as some mixed plants report it is for other processes because there is such a fine chemical balance required between his plate, ink, fountain acid and paper stock. He wants papers developed for his own purpose and not alone as by-products and he doesn't want us or his plant to do it for him unless it becomes necessary.

Now, Gentlemen, off or on the record, as you wish.

I am an employee, as I assume most of you are—a paid hand with an engineering and technical background as well as public relations, advertising and marketing experience and perhaps with more graphic arts and research experience than you suspect. I am not looking for a job. I like this one. I like everything about the job of executive director of the Lithographic Technical Foundation except fund raising. But in a relatively small organization like ours some one has to do it. I am embarrassed before you to even have to mention the subject.

But here are the facts and some suggestions for help you can give if you believe this endowed non-profit, income tax deductible scientific research and educational institution can serve the business of putting ink on paper.

Lithographers are now paying the bill to the tune of 60% instead of 40% as obtained prior to 1944.

Proportional to support from lithographers, ink makers and manufacturers of chemicals, photo supplies, machinery and equipment paper mills are $75,000 on their quota on endowment and $25,000 behind on annual memberships.

If you believe in research and particularly in informational and educational services to effectuate the results paper mills are denying themselves real opportunity to maximum benefit from the modern facilities and manpower available through the reorganized and revitalized L. T. F.

So there are two things you can do about it. Make known the reasons for support if you believe in them. And if technical and production men wish I'll make the time of Professor Reed and such other members of the staff, including my own, available to work out.

(a) Prompt and practical surveys leading to the development of up to date and demand standard specifications and requirements for coated and other papers for offset lithography.

(b) For actual full time work in establishing effective cooperation and working coordination of such lithographic research as should be coordinated with ink and paper.

The war of liberty is over, gentlemen. The war against procrastination and fraction and misunderstanding is on—on a lot of fronts in a lot of industries—unfortunately in the graphic arts there is a tendency, largely because of competitive market, sales and political angles to think in terms of one front. From a factual process standpoint, this is fatal.

Let there be cooperation of all producers of graphic arts finished and ingredient products to get more ink-on-paper. It's a glorious overall business and everyone will get an increased share of the volume.

But when it comes to process, let there be independent research and development uncluttered by generalities and cross currents. The war has demonstrated the attack can be carried on successfully on three or more fronts simultaneously.

We have the manpower and facilities and some funds to carry on the attack on the lithographic front and we will carry on, whether we remain weak in one of the most important salients—paper—or not. But you can plug that gap if you will with inclination, action, additional manpower, funds and facilities.

As Research Looks At Moldable Paper Products

By Harold R. Alley, Research Director
Arvey Corporation

The economic worth of the modern paper converter is measured in terms of his ability to take standard paper items from the mills and convert them into either improved or entirely new products for specific end uses. These products must be attractive, useful, perfectly engineered, and fully competitive with other materials such as foils, synthetic films, cloth, etc.

Research chemists look upon paper as being just another raw material consisting of matted wood or other fibers with or without a few extra frills. The newer end uses call for many new and improved properties in the base material. For example, where can we find:

Paper that is as transparent as glass?

Paper that is bacteria-proof?

Paper that is bacteria free?

Paper that has 100% water resistance?

Paper that has a zero moisture-vapor transmission rate?

Paper that is as inert as glass?

Paper that is an all-around perfect barrier?

Paper that is as moldable as soft metal foil?

Paper that has the machine forming properties of certain metals?

Paper that is as pliable as Pliofilm?

Paper that is as wrappable as .001 2S-0 aluminum foil?

Since paper is a relatively low cost raw material, the answers to some of these questions are a challenge to both chemists and American industry as a whole. Each question involves a rather broad research project in itself. A satisfactory solution to any of the problems involves research manpower, industry-wide co-operation, and persistent effort on the part of one or more inspired mill or converter research groups. It appears that our economic system offers ample rewards to an individaul who or a group which solves any of these rather basic technical problems.

Before World War II, an old-time kraft paper-man asked how he could deliver his paper to the customer with a high moisture content to insure improved wrapping properties as compared to extremely dry paper. His inquiry simply indicated that he was not satisfied with the wrapping properies of kraft paper. After attempting to wrap a penny match box with 60 lb. kraft containing 0%, 5%, and 10% moisture, it appeared that heavy kraft paper had a very low wrapability factor, when compared to .001 inch lead foil. This physical characteristic was a bit disturbing especially when the biggest use of the paper is for the wrapping of miscellaneous objects.

From an address before the Chicago Professional Paper Group.

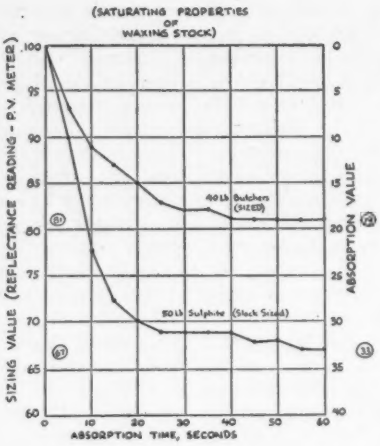
(SATURATING PROPERTIES OF WAXING STOCK)
SIZING VALUE (REFLECTANCE READING - P.V. METER)
ABSORPTION VALUE
ABSORPTION TIME, SECONDS
40 Lb. Butchers (SIZED)
50 Lb. Sulphite (Stock Sized)

FIG. 1
Photo-Electric Absorption Test for Paper

Then came the idea of plasticizing paper with either wax or water. An old newspaper was soaked in water and used to wrap a glass bottle. The wrapping properties improved tremendously and the wrapper possesed high shock resistance. Next a sheet of absorbent tissue was saturated with amorphous wax. The resultant wrapper was extremely pliable. Then came World II with its "Moldable Ordnance Wrappers". Many new wrappings were developed and large quantities were used. At the close of the war, however, no one seemed to have developed test methods to measure or appraise either wrappability or moldability. To show actual technical progress in the improvement of engineering materials, test standards, based on specialized and scientific test methods, must be set up. To test is merely to begin to know. After a standard is established, technical progress may be measured by comparative tests. So it appeared that moldability tests warranted additional study.

Next came a technical asignment to make paper as moldable as .004 inch aluminum 2 SO foil. How moldable was .004 foil? How moldable was paper? Could paper be made as moldable as foil?

To get the answers to these questions demanded a rather broad research investigation. This research project involved the following:

(1) Evaluation and selection of base papers; (2) compounding and selection of impregnants or plasticizers; (3) development of saturating equipment; (4) development of special test equipment to measure absorption properties of paper; (5) development of test equipment to measure moldability (cold-flow under pressure) and springback (resiliency) of foil, raw paper, experimental and production samples; (6) development of application equipment and final product tests.

Fig. 1, captioned Photo-Electric Absorption Tests for Paper and Saturat-

Table I — Order of Plasticity at 175 lb./Sq. inch and 70F

Type	*Plasticity*	*Material*	*Kind*	*Plasticity No. (Estimated)*
A	Very high (fluids)	Plasticizers	Light Oils	100
			Liquid Resins	100
B	High (semi-solids)	Petroleum Compounds, etc.	Petrolatum	100
			Soft Waxes	100
			Soft Resins	100
C	Medium (solids)	Waxed Tissue	Paper & Wax	100
		Aluminum Foil	Thin: .0005; 2-SO	100
		Lead Foil	Thin: .001	100
		Aluminum Foil	.001	95
			.0015	90
			.002	85
			.004	80
D	Low	Treated Paper	50 lb. Sulphite & Petrolatum	80
			50 lb. Sulphite & Amorphous Wax	75
			50 lb. Sulphite & Paraffin Wax	65
E	Very low (semi-stiff)	Paper	40 lb. Butchers	35
		Paper, Oiled	52 lb. Sulphite	50
		Paper, Moist	52 lb. Sulphite	50
		Paper, Plain	52 lb. Sulphite	40
F	Extremely Low (stiff; brittle)	Resins, Hard	Staybelite No. 10	0
		Paper, Saturated	Paper & Hard Resin	0

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A New OSCILLATOR

Operated by water pressure; no oil, grease or upkeep; adapted for all our series of oscillating showers and our new oscillating doctor blade. Small compact and powerful. Watch this space next month for further details.

*

A. E. BROUGHTON & COMPANY

Manufacturers of oscillating showers and unit vacuum controls for paper machine suction boxes.

GLENS FALLS, N. Y.

ing Properties of Waxing Stock, shows the relative oil absorption rates of two different base papers, namely a sized 40 lb. butchers paper and a 50 lb. slack sized sulphite paper. The photo-electric absorption test was used to obtain both sizing (81 and 67 respectively) and absorption (19 and 33 respectively) values and to determine the probable rate of impregnation of saturants. To conduct the test, a standard Photo-Volt reflectance meter was used together with commercial Nujol as the standard impregnant. The paper sample was placed over the top 1 inch hole of the inverted search unit composed of a light source and a photo-electric cell. The true reflectance reading of the paper was adjusted to 100 on the meter dial and then 5 drips of Nujol was placed on the top surface of the paper sample. Reflectance readings were taken at 5 second intervals on the bottom surface of the paper. The drop in the light reflectance on the bottom side of the paper was used to indicate the degree of saturation and to obtain definite sizing and absorption values for various papers. Since penetration through the sheet at the end of the 60 second test period seemed fairly complete, the reflectance values at 60 seconds were used to denote both the degree of sizing and comparative absorptiveness of the papers tested. Machine trials indicated that the photo-electric absorption test method possessed merit for the selection of special types of waxing or saturating stocks.

Fig. 2, titled Plasticization of Paper —53 lb. Sulphite, shows the angles of permanent set and the pressure springback angles of plain (52 lb. sulphite) paper, wet paper, moist paper, oil saturated paper, paraffin wax treated paper, amorphous wax treated paper, .004 inch aluminum 2 SO Foil (commercially pure), and a specially plasticized wrapper (Plastic-Wrap). The test covered by this graph were made at room temperature using pressures ranging from 0 to 500 pounds per square inch. The permanent set and pressure springback tests were devised to determine the actual pressure in pounds per square inch required to effect a permanent 90 degree. bend in the various untreated and treated 52 lb. sulphite paper. This paper normally had a standard springback of 30 degrees after the deadweight, 180 degree bend test used for appraising ordnance wrappers. The test is conducted by placing a 2 in. x 4 in. paper sample on top of a 1 in. x 1 in. x 4 in. steel mandrel and superimposing a piece of 1 in. x 4 in. x 4 in. pure gum rubber on top of the paper test specimen. The mandrel-paper-rubber test assembly is then placed between the upper and lower plates of a standard laboratory Carver hydraulic press. Pressure is applied and the degree of both temporary and permanent distortion of the paper is determined by reading the bendover and permanent set angles at specific pressures through the use of a protracter. The test appears to have merit in that it indicates the pressure required to effect a permanent bend or "set" which seems to be related to the often-used term of "wrappability". Aluminum foil normally has a zero sprinkback. The pressure exerted by the hands in wrapping a package or object can exceed 50 pounds per square inch. The chart indicates that the pressure character-

Table II — Moldable Paper Products

Type No.	*Kind*	*Products*
1	Pliable Hand Wraps	*Household* Food Wraps Sandwich Wraps Jar Covers *Industrial* Metal Wraps Package Wraps Special Wrapping Tissues
2	Pliable Machine Wraps	Food Wraps — Metal Wraps Meat Wraps — Package Wraps
3	Machine Molding Papers	*Heavy Duty Papers* Paper Plates — Egg Trays Paper Dishes — Cuspidors Paper Trays Cake Circles Pressure-Formed Packages (MOLDED PACKAGES) *Light Duty Papers* Doilies — Tray Covers
4	Die-Forming Papers	Tumbler Tops — Disposable Ash Trays Coasters Closures
5	Pressure-Sensitive Wraps	All Types e.g. food, sandwich
6	Fully Sealable Wraps	Frozen Food Food Bags Carton Innerliners Carton Overdrap Package Wraps
7	Multi-Ply Wraps	Food Wraps, etc.
8	Special Moldability Wraps	Adjusted Pliability wraps for specific pressures and temperatures
9	Entirely New Products	Printing Mats Pressed paper products such as plaques Embossed paper products

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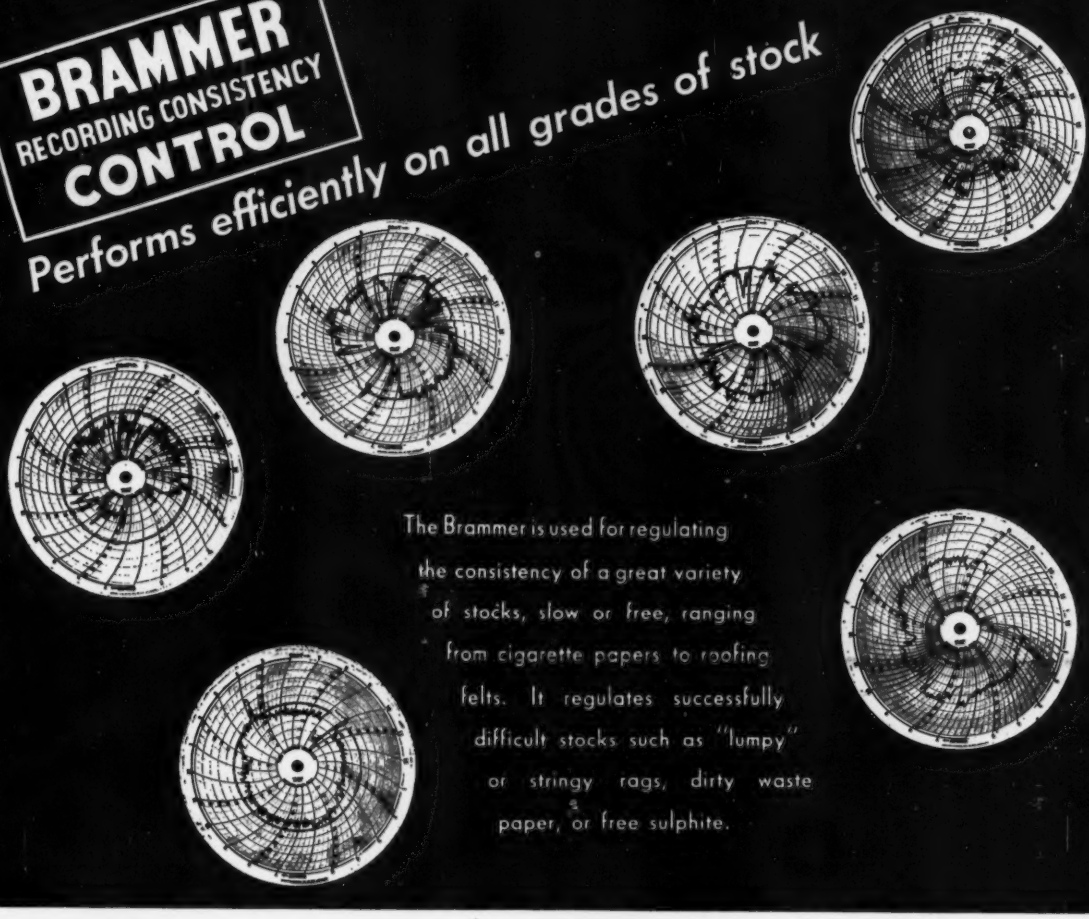
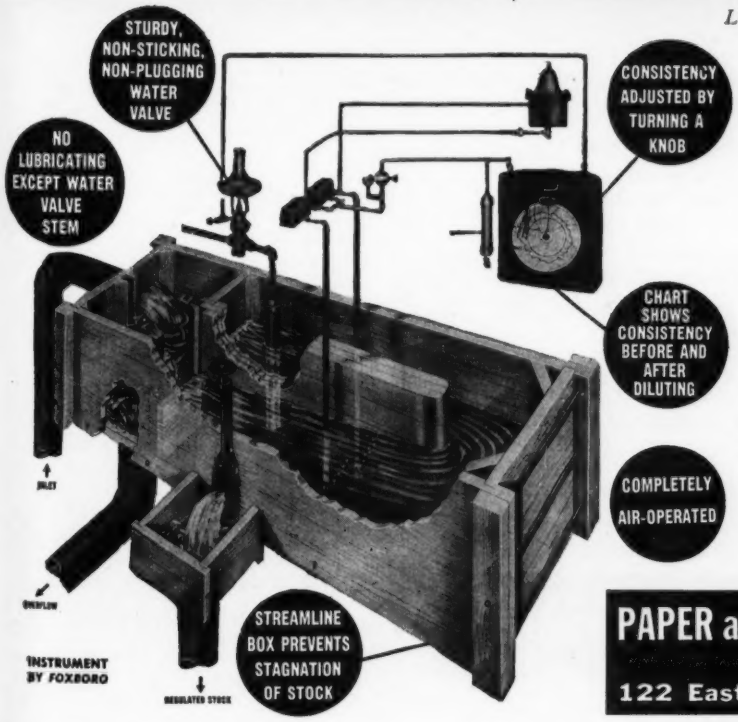
BRAMMER
RECORDING CONSISTENCY CONTROL

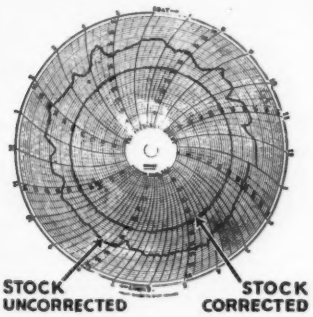
Performs efficiently on all grades of stock



The Brammer is used for regulating the consistency of a great variety of stocks, slow or free, ranging from cigarette papers to roofing felts. It regulates successfully difficult stocks such as "lumpy" or stringy rags, dirty waste paper, or free sulphite.

Licensed under U. S. Patent Numbers: 1,810,111—1,884,075—2,302,326—2,302,327


STURDY, NON-STICKING, NON-PLUGGING WATER VALVE
NO LUBRICATING EXCEPT WATER VALVE STEM
CONSISTENCY ADJUSTED BY TURNING A KNOB
CHART SHOWS CONSISTENCY BEFORE AND AFTER DILUTING
COMPLETELY AIR-OPERATED
STREAMLINE BOX PREVENTS STAGNATION OF STOCK
INSTRUMENT BY FOXBORO



24-hour record chart, showing consistency before and after diluting water has been supplied

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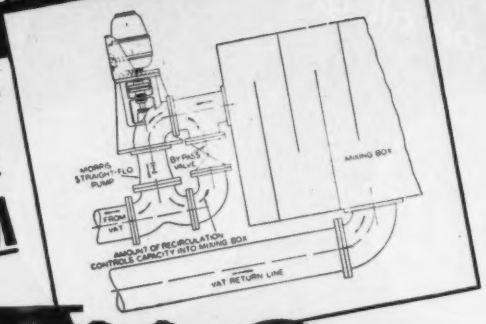

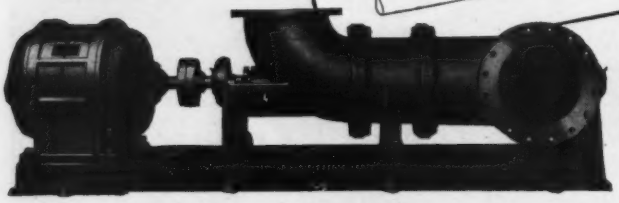

Either Vertical Straightflo or horizontal type may be adapted to this installation.

The MORRIS Straightflo

None of the efficiency losses of a variable-speed AC motor. No expensive DC installations. No hydraulic or electric drive couplings. Just a simple BY-PASS SYSTEM that recirculates the unwanted pulp back through the pump.

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VARIABLE CAPACITY

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That's the secret of the Morris Straightflo Vat-Circulation Pump. It gives you high volume or low volume . . . both at low head, and with no increase in power consumption as the delivered volume is increased.

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Morris Straightflo (axial flow) Pumps are built to the specific requirements of the job, designed to give optimum performance under all the conditions encountered. Suction and discharge elbows can be furnished in almost any position desired. Write for bulletin No. 167.

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MORRIS **CENTRIFUGAL PUMPS**

istics of the "Plastic-Wrap" are better than those for the pure .004 in. aluminum foil. In other words, the paper, when fully and properly plasticized has better permanent set properties (0-200 pounds per square inch) than the foil. It is also interesting to note that the 2300 amorphous wax curve compares favorably with this general type of ordnance wrapper, and also excels the wrapping properties of paraffin waxed papers. By careful choice of plasticizer, one treated sample of the 52 lb. sulphite was produced which had pressure-forming characteristics almost identical with the .004 in. aluminum 2-SO foil.

Fig. 3, labeled Moldability Test Methods, shows sketches of three different types of test equipment, sketches of eight different test plates, and a table showing the results of a micro-bulge test at 410 pounds per square inch and 70 Fahr. The moldability test were designed to either indicate or actually measure plastic or cold flow of wrappers under pressure a room temperature. Test plan no. 1, 2, 3, 4, 5, 6 and 7 together with the Carver press were used to evaluate papers for moldability by inspection only. The Mullen bursting strength tester may be used to obtain actual cold-flow-under-pressure moldability values of various sheet materials. The height of the bulge is the moldability value expressed in thousandths of an inch. Regular bulge values are taken at the pressure point just below the n o r m a l bursting strength of the material tested. The micro-bulge values are obtained by placing a piece of perforated metal on top of the paper test specimen, placing in the Mullen tester, applying a fixed pressure and measuring the height of cold flow in the metal openings via microscopic focusing technique (See Chamot and Mason; Textbook of Microscopy). It appears that the use of a calibrated liquid void plate together with an air-rubber membrane test device should yield improved scientific values for moldability of paper and

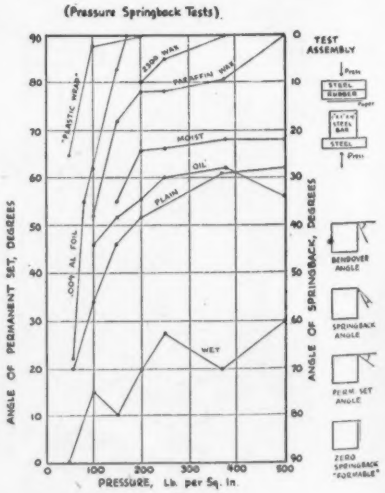
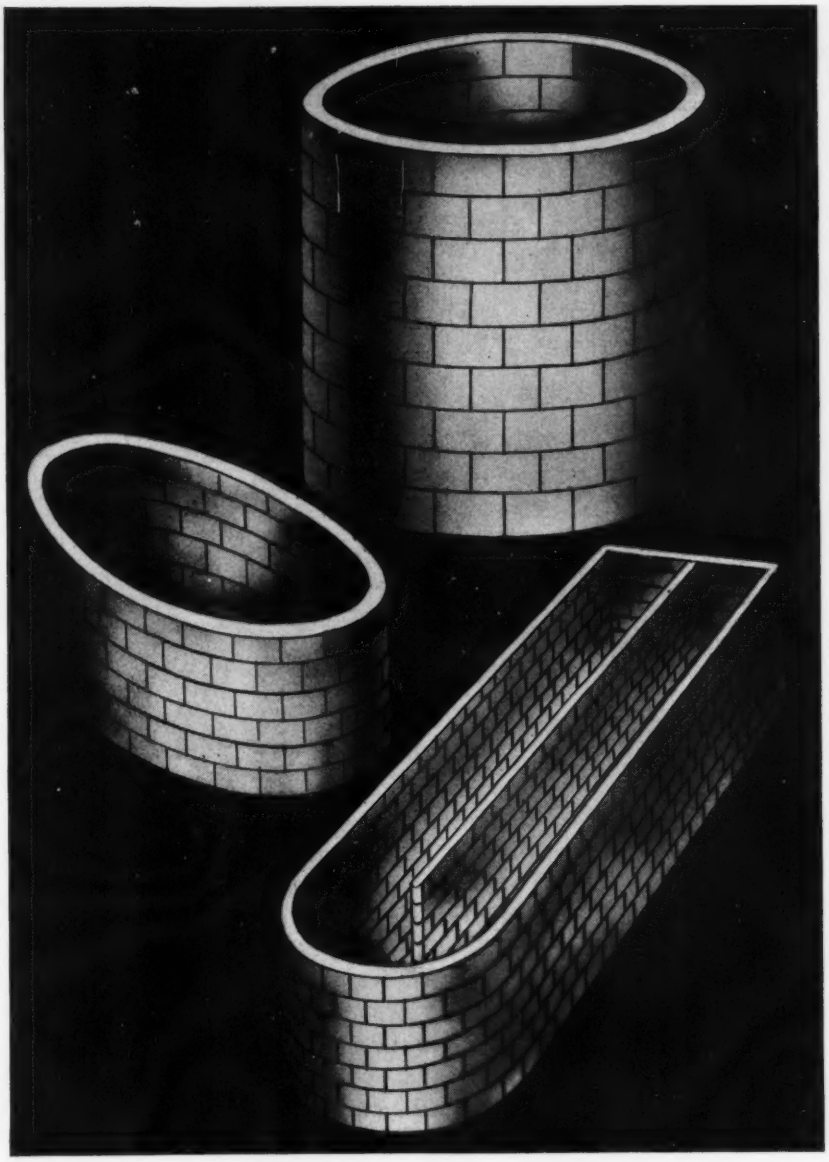


FIG. 2

Plasticization of Paper — 52 lb. Sulphite

ANY SIZE *or* SHAPE *of* PAPER MILL TANK *or* CHEST *can be built with*



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Consult our Engineers for ESTIMATES

KALAMAZOO TANK & SILO COMPANY

Kalamazoo, Michigan : U.S.A.

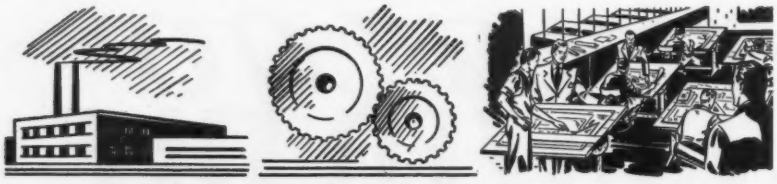
Here on a mammoth lathe in the Cheney Bigelow plant the shaft for a giant stainless steel cylinder mould is in the process of taking shape.

It is a ten-inch hollow shaft that was centrifugally cast from KA2SMO (Type 316 stainless steel) and will be used on a cylinder mould also entirely constructed of this metal.

The use of stainless steel is rapidly growing in paper mills because of the many advantages which have been proved for it. In pace with this movement, Cheney Bigelow has pioneered in the manufacture of stainless steel cylinder moulds.

For the best in service and craftsmanship on cylinder moulds of *any* material, call on Cheney Bigelow.

MORE FACTORY SPACE · MORE PRECISION MACHINERY · MORE ENGINEERS



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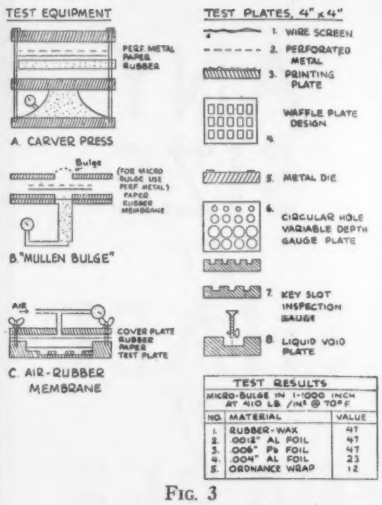


FIG. 3
Moldability Test Method

other sheet materials. The calculation of moldability values using this latter device would be somewhat as follows:

Void Volume of Moldability Test Plate, Empty	11 cc
Volume of Paper Test Specimen	1 cc
Available Volume at Start of Test	10 cc
Remaining Volume after Molding	9 cc
Moldability	90%

Table 1, entitled Order of Plasticity, shows the estimated plasticity numbers for liquid plasticizers, semi-solids, and solids such as paper, various thickness foils, waxed and impregnated paper, pure resins, etc.

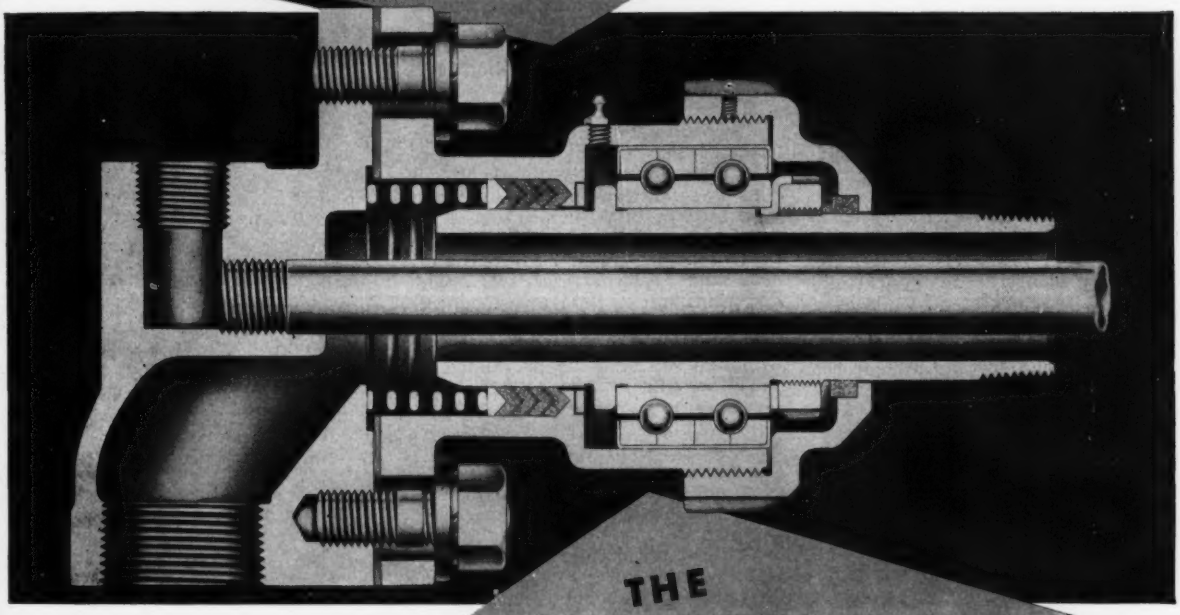
Table 2, entitled Moldable Paper Products, indicates that there are at least 9 different kinds of paper products which are related to the general subject of moldability. One of the newer and more promising fields for new uses for paper appears to be the use of highly plasticized papers for straight line, machine packaging in which commercial items are placed between two moving belts of moldable paper. The moldable paper is formed around the part or product with two rubber faced press plates yielding finished packages similar to aspirin tablets. This technique is referred to in the table as "Pressure Formed Packages" or "Molded Packages".

1. This entire subject of plasticization of paper and moldability offers a promising field of new product development for the paper mill, the converter, the manufacturer, and the ultimate user of plastic paper products.

2. There is a definite need for additional research on plasticized papers. The number of new products is limited only by the amount of consistent research by either individuals or firms. This subject seems to deserve more thought on the part of a larger number of paper technologists, and incidentally raises the question as to what will the general public or the industrial user pay for fully moldable paper products such as wrapping materials for miscellaneous end uses.

A TIME AND MONEY SAVER

for the Paper and Textile Industry



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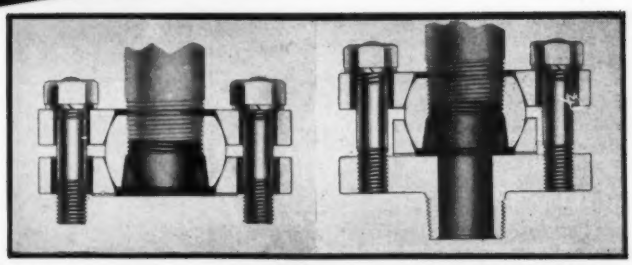

BARCO BALL FLANGE
Cross-section view of Barco Ball Flange for use on threaded and flanged rolls for correcting roll misalignment. Sleeve can rotate concentric even though threads on roll are tapped off center.

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Corpolin Compares Its Qualities To Those of Glycerin

Chemically, one has to distinguish principally between two classes of glycerin substitutes: first, those substances which show chemically some similarity to glycerin; namely, polyhydric alcohols like the various glycols, sorbitol, pentaerythritol, etc., and secondly, those products which belong to very different classes of chemicals, with no chemical similarity to glycerin, often composed of several bodies, or "built up" for certain purposes. Only the first type of substitutes can replace glycerin, where the alcoholic groups are chemically essential; e. g., for condensation or polymorization reactions. The second type of substitutes are substitutes only in the physical sense; i. e., they seek to imitate a few physical properties like hygroscopicity, gravity, viscosity, etc.

Corpolin belongs to the physical substitutes. It was not at all made as a substitute, yet rapidly became known as one when industrial technique required such substances. Corpolin has merits of its own, because those properties which it has in common with glycerin e.g., hygroscopicity and weight, are developed in a considerably higher degree than is shown by glycerin. Besides, it has valuable properties which are not found in glycerin; e.g., non-inflammability and non-volatility.

Corpolin is a clear, colorless, non-inflammable, heavy, non-volatile liquid that is practically odorless. It is miscible with water, glycerin and many other liquids. It is less viscous than glycerin, 7 centipoises at 25°C. Taste is acrid; it is practically neutral, pH is usually 7.6 to 7.8; yet this is not constant and not a characteristic figure; it may vary without effect on the hygroscopicity. The specific gravity is 1.53; the average index of refraction is 1.4477. Corpolin is non-poisonous.

The foremost property of Corpolin is its hygroscopicity. In numerous experiments it has been compared with glycerin and many other hygroscopic liquids and substitutes for glycerin, and in all tests has been found to be far ahead of other tested products, which shall not be mentioned individually, except glycerin.

The trials were made with 15 grams of each product placed in Petri dishes of 97 mm diameter, at room temperature, enclosed in a dessicator which contained water for trials at 100% rel. hum., or other special solutions for trials at 75% and 30% rel. hum.

Fig. 1 gives the quantities of attracted moisture of Corpolin and glycerin at these three relative humidities. It would not be surprising if other experimenters would find different figures because the results depend on the ratio of the exposed surface to the quantity or volume of liquid; but regardless of this, the differences will be in a similar proportion. The curves show that the relative differences in the amounts of attracted moisture are the greater in favor of Corpolin, the lower the relative humidity is. At 100% relative humidity glycerin attracted 83%, at 75% rel. hum. 74%, and at 30% rel. hum. only 50% of the moisture attracted by Corpolin, under the same conditions.

Moisture attraction goes parallel with moisture retention. So, it may be expected that Corpolin retains moisture more tenaciously than glycerin. This is so. Interesting conditions are illustrated in Fig. 2 which shows the course of a trial made with 15 grams each of a mixture of 7.5 grams Corpolin and glycerin respectively, with 7.5 grams water. Both mixtures were put into Petri dishes of 97 mm diameter and kept at room temperature without cover. At the prevailing air conditions during the first day the Corpolin-water mixture was not yet saturated, and attracted 8% more moisture. In contrast to this, the glycerin - water mixture had already too much moisture and gave off 20% within the same time. During the second day other air conditions prevailed, the moisture in Corpolin decreased to 95%, and that of glycerin to 45% of their orginal amounts. At elevated temperatures (190°-195°F.) Corpolin also retained moisture better than any other investigated liquid.

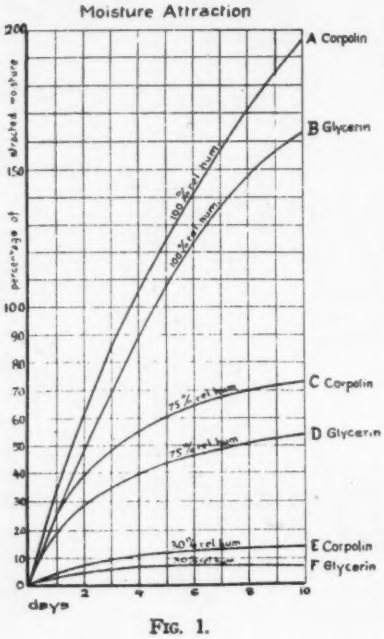

Fig. 1.

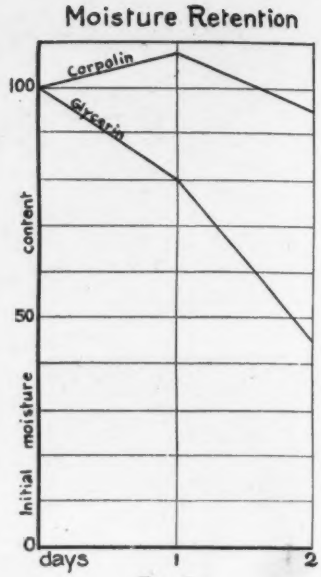

Fig. 2.

In the ease, or speed with which it enters capillaries and penetrates objects Corpolin compares favorably with glycerin. Both products were diluted with water 1:1, and the heights measured to which both solutions rose in heavy blotting paper, in fifteen-minute time intervals.

Time	15	30	45	60 min.
Corpolin	35	46	54	69 mil.
Glycerin	25	32	35	39 mil.

Whether the greater capillarity of Corpolin is caused by the lower surface tension, or the lower viscosity, has not been investigated.

Corpolin has a viscosity of 7 centipoises at 25°C., while the corresponding value of glycerin is 945. A comparison between the viscosities of Corpolin and glycerin is easier to imagine by saying that Corpolin has approximately the same viscosity as a glycerin-water mixture containing 56% glycerin c. p.

The specific gravity of Corpolin is higher than that of glycerin; namely, 1.53 against 1.26. One gallon of Corpolin weighs 12.8 lbs. This high specific gravity is helpful when, besides hygroscopicity, addition of weight is desired. One gallon of a Corpolin-water mixture containing only 5¾ lbs. of Corpolin, is as heavy as one gallon of pure glycerin; namely, 10½ lbs. Corpolin is considerably heavier than the saturated solution of any usual salt.

Figure 3 represents the relation of the specific gravity of Corpolin-water mixtures to the concentration, measured in pounds per gallons, as well as in grams per kilogram. In order to find the concentration when the specific gravity is known, draw a horizontal line through the point indicating the specific gravity; from its crossing point with the two curves draw vertical lines to the upper and lower scales, respectively, and read the values indicated.

Corpolin is non-inflammable and im-

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parts this property to objects, by which it is absorbed in proper amounts. An example: 100 grams heavy Kraft paper impregnated with 20 grams of Corpolin will not burn with a flame when held into a flame, but will only char with a glowing edge. While charring takes place, the volume increases. Paper is being plasticized and made non-inflammable in one single operation.

Corpolin is an ionic compound, while glycerin, as a trihydric alcohol, is not. This is a principal difference between the two hygroscopic agents, which explains other differences to be related in the following items. As an ionic compound, the ionic state of Corpolin is dependent on the quantity of water which is present, or in which it is dissolved. The orginal pH of Corpolin is fixed at 7.6 to 7.8; but if mixed with ten times its volume of water, the pH sinks to about 6; In Fig. 4 the heavy curve represents concentrated Corpolin, the light curve its solution in water 1:10.

This figure further shows how the pH increases by adding caustic potash, and shows how this influences the pH of the water solution. If, for example, 3 grams caustic potash (30 cc of 10% solution) are added to 1 kilogram of Corpolin, the pH rises from 7.6 to 7.95, and the corresponding water solutions have the pH 6.15 and 7.0, respectively, still less alkaline than the concentrated Corpolin. If, however, 4 grams of cautic potash are added to 1 kilogram of Corpolin, the pH of 8.2

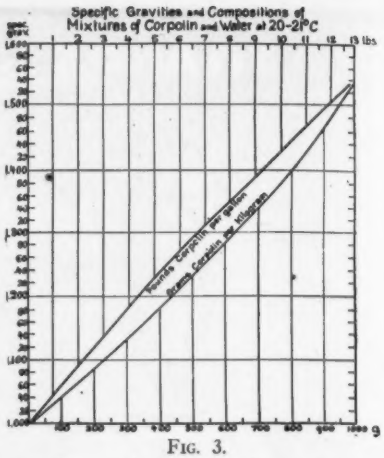
Specific Gravities and Compositions of
Mixtures of Corpolin and Water at 20-21°C
lbs.
Pounds Corpolin per gallon
Grams Corpolin per kilogram

FIG. 3.

remains unchanged in the water solution. The pH of Corpolin is variable; it is not a characteristic figure and may be adjusted to any desired or proper value.

Corpolin has no boiling point and no freezing point. On heating to about 220°F. a slight appearance of boiling occurs, but this is only the evaporation of a little water and the generation of some ammonia. If the 10% water contained in Corpolin were evaporated, the product would solidify, but remain as hygroscopic as it was.

On cooling, Corpolin does not freeze. At 7°F. (-21.6C) below zero it becomes a viscous gel. A 10% solution of Corpolin in water freezes at 24°F. (-4.4°C.); a 25% solution at 9°F. (-12.8°C.) Corpolin as an ionic compound, is not recommended as an anti-freeze.

Although Corpolin has no freezing point, it shows, when exposed to winter temperature during transit, some crystallization on its surface. The crystals remain loose and separated, not impairing the flow of the product. By the addition of about 10% of hot water the liquid usually becomes clear immediately. Or, if no water is desired, the crystals may be removed by straining through a double layer of cheesecloth. The removal of the crystals does not affect the plasticizing or moisture attracting properties of Corpolin.

9. Corpolin As A Solvent

Corpolin is by far not so universal a solvent as glycerin or similar substances. However, quite a variety of substances are soluble in or miscible with Corpolin. After extensive research it has become evident that only such substances are soluble in Corpolin which are soluble in water.

The extensive use of glycerin for plasticizing glue and gelatin makes it advisable to stress the differences in the action of Corpolin on these substances. Corpolin has no plasticizing or gelatinizing effect on glue and gelatin; on the contrary, it prevents their solutions from gelatinizing when proper quantities are used.

The influence of various percentages of Corpolin on gelatin solutions of various concentrations is as follows:

1855

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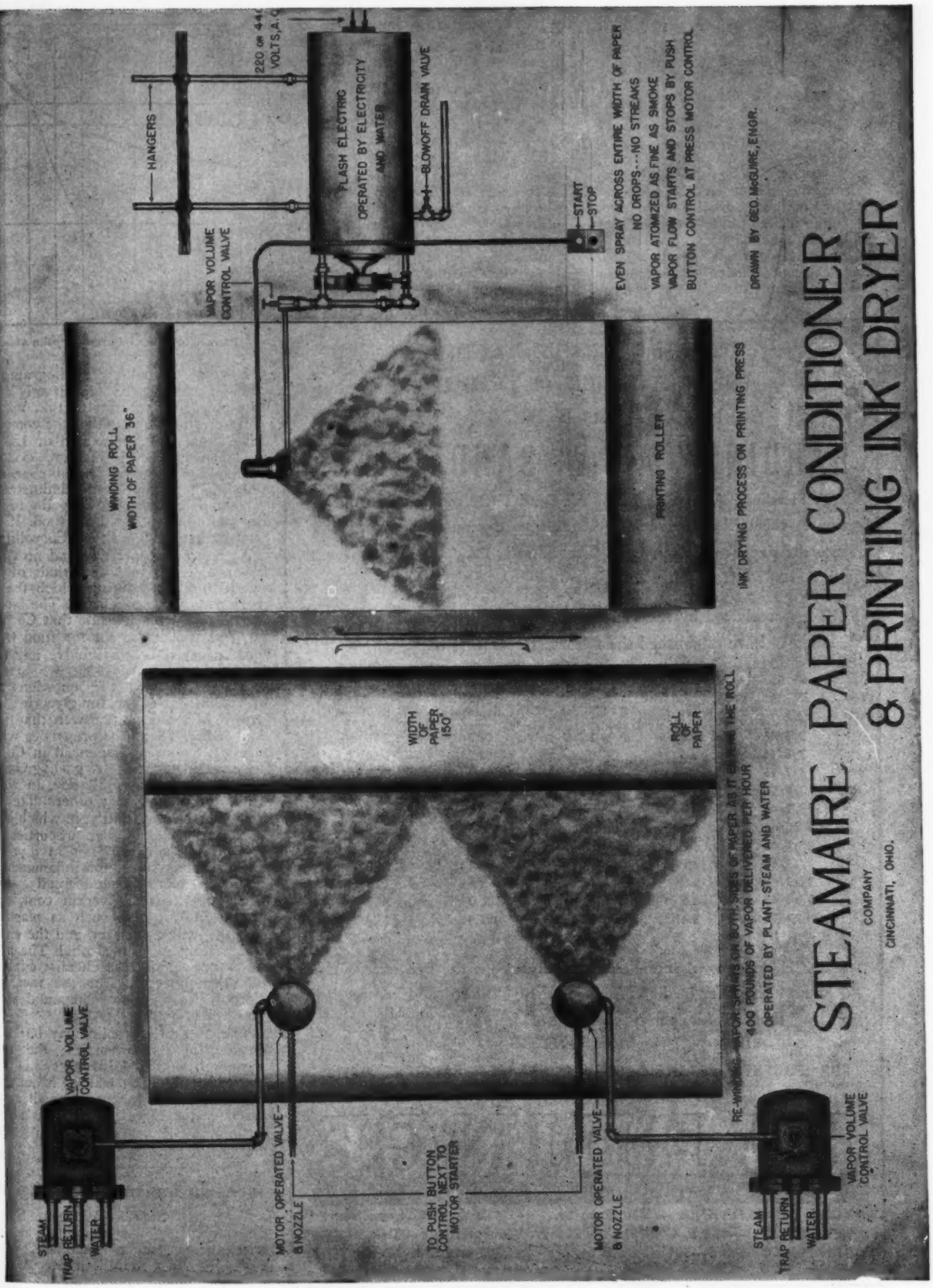
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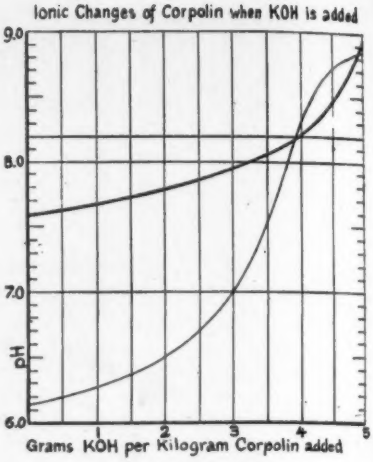
OPERATED BY PLANT STEAM AND WATER
WINDING ROLL
WIDTH OF PAPER 36"
PRINTING ROLLER
ROLL OF PAPER
WIDTH OF PAPER 150"
FLASH ELECTRIC
OPERATED BY ELECTRICITY
AND WATER
BLOWOFF DRAIN VALVE
HANGERS
START
STOP
VAPOR VOLUME CONTROL VALVE
MOTOR OPERATED VALVE & NOZZLE
TO PUSH BUTTON CONTROL NEXT TO MOTOR STARTER
STEAM
TRAP RETURN
WATER

10	grams	gelatin	in	90	cc	water	:	3.3	g	Corpolin prevents gelatinizing.
25	"	"	"	75	"	"	:	8	g	" retards gelatinizing for 12 hours,
								16	g	" " gelatinizing for 2 days,
								25	g	" prevents gelatinizing.
40	"	"	"	60	"	"	:	20	g	" retards gelatinizing for 12 hours
								40	g	" prevents gelatinizing.
50	"	"	"	50	"	"	:	50	g	" prevents gelatinizing.

From this list it can be concluded that by combing Corpolin with glycerin, any desired state of plasticized gelatin or glue can be obtained.

Gums and starches swell in Corpolin. Starch pastes are rendered smoother when Corpolin is added, and resist much longer to Syneresis (expeling water), thus retarding aging.

Corpolin is non-toxic. This statement is based on the results of experiments made by an approved Public Health Laboratory, which found that the minimum lethal dose for rats is 9 grams of Corpolin per kilogram. Although it is incorrect to directly apply the physiology of rats to that man, it is interesting to note that the comparative lethal dose for a man of 150 lbs. weight would be 1⅓ lbs.



Another series of trials concerned the effect of continued administration of small amounts of Corpolin to rats by adding it to the daily food. It was stated that 1.5 grams of Corpolin per kilogram of rat per day had no effect, whatsoever, after a period of six weeks, the time during which the experiments were conducted. The biological experiments indicate that Corpolin as a plasticizing agent for food wrapping paper does not involve any danger to health.

When we ask the question: "Is Corpolin a substitue for glycerin?" we know why we can answer that it is and is not. There are properties which are much more pronounced in Corpolin than in glycerin; e. g., hygroscopicity, gravity and capillarity, in which Corpolin is superior; others like viscosity, dissolving ability, in which glycerin is superior. Other properties are met in Corpolin but not in glycerin, such as ionic state, non-inflammability and non-volatility; and finally, there are properties of glycerin completely absent in Corpolin, such as plasticizing of glue and gelatin, and the chemical character of an alcohol. The main difference which to a chemist explains all other differences is the fact that Corpolin is an ionic compound while glycerin is not.

The uses of Corpolin may be based on any of its properties; the most frequently utilized property is the hygroscopicity in which it excells. Corpolin is a substitute as well as an extender for glycerin, and it is also a technical, chemical tool on its own merits.

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Tests conducted by the Hardinge Company between March 5 and March 14 have established the following operating data:

Date	P.P.M. Suspended Solids Influent	Effluent	Percent Removal	Flow MGD
3/5/46	12.0	1.3	89.2	3.25
3/6/46	8.4	0.64	92.2	3.50
3/7/46	9.3	0.04	99.4	3.25
3/8/46	6.2	0.20	96.8	3.25
3/9/46	7.8	0.08	99.2	3.25
3/10/46	4.6	0.08	98.5	3.25
3/11/46	8.2	not weighable	100.0	3.25
3/12/46	10.1	.09	99.2	3.25
3/13/46	9.6	.04	99.5	3.25
3/14/46	8.5	not weighable	100.0	3.25
AVERAGE	8.47	0.25	97.4	3.25

The cleaning mechanism automatically cleans the bed once every 6 hours. The filter media consists of a 10½" deep sand bed carried on 1¼" thick Aloxite porous plates.

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Some Reflections on the Responsibilities of Supervisors in the Field of Labor Relations*

By G. R. Schenck[1]

Abstract

The importance of industry's superintendents and junior supervisors as a major factor in labor relations is stressed. It is recognized that a full understanding must be maintained throughout a whole organization to obtain harmonious relations. The role of management and the foreman is discussed together with their responsibilities.

Attention is given to personnel problems and to the handling of complaints and grievances. A few basic principles for conducting interviews are presented for consideration.

When requested to participate in the program of this meeting of papermakers, and asked to decide upon the subject to be discussed, the author concluded that he would like to deal with a subject that has always impressed him as being the true keystone in the arch of sound industrial relations. This is the importance of industry's superintendents and their junior supervisors as a major factor in labor relations. Truly in these days of bewilderment in labor relations and frequent management frustrations, the responsibilities of line executives, superintendents, and foremen, as well as of industrial relations executives, is very great indeed. Industry, yes, perhaps free enterprise itself, must lean heavily upon the judgment and the ability of all to appraise properly the many and varied ideologies and doctrines that now are so freely wafted about. The success in separating the grain from the chaff and then standing squarely behind that which is good, while the irresponsible prattle is discarded and exposed to the glare of the sun, may determine the course of industrial events for years to come.

Those who are from the author's organizations know that he is not a papermaker and that he sometimes confuses such things as "sulphite" with "sulphate," or mix the winders and rewinders and supercalender operators in discussing the various occupations. To the author, at least, this is not too important and his semi-isolationism from the intimate terminology of the industry may have been rather helpful than otherwise to both his associates and himself. This is said because in some twenty years' experience in industrial relations, in a wide variety of industries, one of the strongest impressions has been that the same general principles that promote sound and desirable human relations apply to all of them and that the variations are matters of detail of application rather than of principle.

Industrial Relationships

These remarks have been prefaced in this fashion because there may be some who will feel that what the author has to present is rather naive and commonplace. It is not intended to discuss the legal, technical, or political phases of labor relations which are currently being debated with so much vigor over the radio and in the newspapers, magazines, and journals. When all of these passionate and learned dissertations are boiled out, the one fact that remains crystal clear is that the basic problem in industrial relations in any company, in any industry, in any part of the globe, is how best to get the cooperation of employees in attaining the collective purpose of the organization. By that is meant that there must be teamwork if it is expected to make a product of the right quality, in the right quantity, at the right time, and at the right cost. This must be the responsibility of the line organization. Likewise this must be the ultimate objective of any good industrial relations program. This paper, therefore, is concerned with the one most effective instrument that industry has — the plant superintendent and his foremen and how they can be most effective.

If it is agreed that the primary problem is how to obtain understanding teamwork among all members of the working force, then one of the most important corollary problems is how to develop and maintain an unobstructed channel of communication within the organization from the top to the bottom. Unless people are talked to and the management's plans discussed, it cannot be expected that they will work for the company intelligently. Human nature is much alike the world over. Just as there are executives and supervisors who would like to know what the employees are thinking about, so, they, too, would like to know more about management's plans and objectives. Just as management wants to express its feelings and desires so they, too, like to have freedom of expression and discussion with the management family. It is a truism that in human relations the confidence of others are enjoyed to about the same degree in which they are confided. Can enthusiastic cooperation and teamwork with either supervisors or rank and file employees through any channel other than consultation and the solicitation of opinion and sug-

*Presented at the meeting of the American Pulp and Paper Mill Superintendents Association held at Poland Springs House, Poland, Me., June 17, 1946.

[1] Director, Industrial Relations, Riegel Paper Corp., New York, N. Y.

gestions be reasonably certain? The answers to these questions should be obvious. This to the author is the one major human problem in industry because there exists considerable and unavoidable separation between the top and the bottom. It is here that the superintendents and their supervisors at each successive level in the organization must play a vital part in relaying information accurately up and down the line if teamwork is to be achieved.

Although these remarks are confined mostly to one phase of the supervisor's responsibility in the field of labor relations, the author would like to go one step further and explain the distinction between line or production supervision and staff or service activities. The line supervisor must schedule his men and his materials because he needs both to produce his product and he must deal with his men in a fashion to preserve their effectiveness just as he must oil and maintain his equipment to keep it operating at full effectiveness. He needs both tools to do his job. The personnel department, on the other hand, should be a staff, or service department, to assist the line supervisors through advice and counsel in carrying out this responsibility. By the same token, the administrative duties of the personnel staff should be only those specifically delegated to it with the full knowledge and consent of the line organization. In this separation of line responsibilities from those of an advisory staff department, line supervisors should take full advantage of the technical assistance which should be available to them through the services of a competent, well-trained personnel staff.

Responsibility of Supervisor

The fact is to be emphasized that the supervisory forces are the real administrators of labor relations policy. The acceptance of this premise underlies this entire discussion. One requisite, of course, to making this conception of the responsibility for industrial relations administration workable is that the supervisory personnel be selected and trained with is objective in mind. Too often, perhaps, an employee is promoted to supervisory rank solely because he was a skilled operator with long years of service. It is not intended here or elsewhere to minimize the importance of technical or mechanical knowledge and skill, but the suggestion is made that under the present and future status of labor relations as a major responsibility of management, the foreman must also be selected because he has demonstrated potential leadership that will help him in handling employees. The importance of this qualification was demonstrated by a survey recently made by one large company. The management of that company was astonished to learn that its foremen were spending almost 30% of their time on problems of human relations. The proportion of time obviously would vary according to the type of operations. It may be stated though, as a rough rule of thumb, that the time spent on employee relations will vary in direct proportion to the rate of labor cost to the sales dollar and in this the paper industry ranks relatively high.

Acceptance of this concept of the responsibility for the sound administration of a company's industrial relations program leads directly and logically to the next point; that is, how can the supervisors be expected to administer labor relations in the plant unless they know what the policies are and unless they are kept informed currently on how these policies are to be interpreted. Unless there is a regular, rather than a spasmodic channel of communication, the supervisors and consequently the executives, will fail in the proper discharge of their labor relations duties. To be effective, such a channel of communications must rest upon a framework of clearly stated and written labor policies that lend themselves to uniform and equitable interpretation. Unless such a framework has been provided, the problem of assuring uniform interpretation and administration of labor policies becomes hopeless and the supervisory forces become impotent. Is it fair to ask the supervisors to administer management's policies blindly, or to expect them to function smoothly or intelligently unless they take part in policy discussions and so believe sincerely that they are part of the management? Can not this store of knowledge among the supervisors be utilized and at the same time give them added confidence in their status? Should other than passive resistance or perhaps resentment be expected when there is failure to demonstrate confidence in them?

Company Policy

How then should this problem be approached? The desired results cannot be had merely by reducing policies to writing. Policies, if they are to be effective, must be accepted whole-heartedly by supervisors as practical and realistic guides to action. This means that they must be clear in meaning and shaped to fit the particular requirements of the individual organization. Too often policy statements are regarded, and perhaps properly so, as idealistic, academic, and unworkable. Too often they bear the earmarks of having come from the "ivory tower." They are resented by those who must try to administer them.

It is believed that if these criteria of good policies are to be met, supervisors at all levels in the organization should actively participate in the formulation of the policy statements. The foreman, for example, because of his responsibility for operations, is in a peculiarly advantageous position to reflect the attitudes of his employees toward management's proposed plans and practices and his knowledge should be utilized. The superintendent can and should contribute to the process of policy formulation because of his broad knowledge of both departmental and inter-departmental operations and problems. The collaboration of top executives becomes necessary because it is at this level that final decision must rest when proposed policies involve sizeable financial commitments or long-range personnel adjustments and planning. Successful experience with this form of consultative management indicates clearly that each level of supervisors can and should make its own contribution to the process of formulating policy statements and their attendant administrative procedures. The personnel or industrial relations department should function throughout this entire process in an advisory capacity and should provide the necessary research so that the policies developed by line management will be in keeping with accepted and current good practices and trends in the industry and in the geographical area.

This principle and practice of collaboration in policy formation is equally applicable and perhaps even more important in situations where there are union agreements. As many know, the well schooled union steward—and union stewards will become better schooled as time marches on—is likely to do a thorough job of policing and the contract provision will in all probability become as sacred to him as the Koran to the Mohammedan. He believes in his con-

tract just as the Arab believes in predestination and the will of Allah, and perhaps this is not a disadvantage after all because if he is understood and approached in a spirit of understanding and conciliation his activities may help to fairly and equitably administer labor policies. But the foreman and his superiors must also be thoroughly acquainted with existing contract provisions and when the contract is up for renegotiation their opinions and suggestions should have been solicited and summarized. Who, other than these line supervisors, know better how the contract has worked and what the rank and file employees really want?

From the supervisor's own standpoint there are many advantages to this program of consultative supervision. As new situations arise, the supervisor becomes accustomed to thinking in terms of policy intent and correct application because he has participated in their making. He appreciates better the necessity for avoiding precedents which cannot be applied equally in similar situations in both his own group and other departments. He knows the meaning and importance of flexibility of action but he appreciates also the need of conforming to reasonably prescribed standards. He has had an opportunity to see the background of thinking and of events which brought the policy into being. He has been afforded the chance to understand the "why" as well as the "how" of administrative practices. He has been encouraged to develop a sense of mutual responsibility for policies and practices. In short, the supervisor who has had a part in such a program of consultative management, if he was properly selected in the first instance, finds that he has grown in stature in the eyes of his management, in the opinions of his subordinates and in his own self esteem.

Personnel Problems

In another direction also, the responsibility for harmonious relations lies almost completely with line supervision. Reference is made to the individual problems of employees. The supervisor who knows his men will be aware of their personal difficulties and can assist them to become better oriented to their situations. An employee who is well oriented is a satisfied employee and as such he is willing and anxious to cooperate. Such problems and personal contacts touch almost every phase of labor relations. Little more than listing some of them can be done but it will be recognized that in each case the attitude and the activities of the supervisor can be most important to their proper solution.

1. There are problems of employment and placement—the ever present question of who fits best in a given job. Poor selection and placement are always reflected in labor turn-over and will be found lurking in the background of many complaints and grievances. Supervisors should be responsible for the final selection of employees from among the applicants referred to them. In this they should have the guidance and council of the personnel staff.

2. There are problems of training—how to instruct workers in the methods of doing their jobs. This is almost wholly a responsibility of line supervision but again the experience in other companies and in other departments in the mill should be available through the personnel department.

3. There are problems relating to working conditions, safety, and health—how to maintain reasonable hours and to distribute overtime fairly. The question of how best to maintain congenial and healthful working conditions and how to eliminate unsafe conditions and practices, fall into this category. Again the supervisor is in a position to recommend action but he would do well to consult the personnel department freely and get all of the facts and experiences that is available there to guide him.

4. There are problems of wage payments—how to pay employees adequately for the work they do. The supervisors intimate knowledge of the job is an important factor in setting job rates, whether these be established through job evaluation, wage surveys, or any other system that may be used.

5. There are problems relating to promotion—how to advance people in accordance with their demonstrated abilities. Who knows the individual better than the one who supervises his work and management would do well to learn heavily on his judgment.

6. There are problems relating to the so-called welfare of employees—how to help them in time of need and retirement, as well as how to provide social and recreational activities for them during their periods of employment. The council of the supervisory staff should be of great value in the formulation of all such programs.

7. There are problems relating to collective bargaining in organized plants, or of dealing with individuals or groups of employees in unorganized mills. How can the employees be given the opportunity of saying and doing something with regard to the conditions of their employment, and how can it be certain that the decisions meet with their general approval?

Handling of Complaints

This latter point the author would like to expand a little more fully because from the standpoint of the supervisor frequently it involves the handling of complaints and grievances. It has been said that grievance machinery lies at the heart of the collective bargaining contract. Likewise it should be emphasized that the prompt and equitable adjustment of complaints is of equal importance in the plant that has not been organized. In either case, the fundamentals are the same, although the mechanics may differ. Don't let us sing ourselves to sleep by humming the tune "we have no grievances because we have no union." Make no mistake on this score, grievances do exist and always will in any group of people who are endeavoring to work together in a common purpose.

The characteristics of a formal grievance procedure are not to be discussed in detail. Grievance machinery as provided in collective bargaining contracts or as established by management in unorganized plants should be constructed from the same general blueprint. It is generally agreed that any grievance should be first taken up with the immediate supervisor of the employee or employees concerned. Most grievances should be settled at this level. The experience of many companies is that upwards of 80% of the grievances are settled between the foremen and the employee or his representative. Failing such settlements the machinery should establish channels involving management and employee representatives on progressively higher levels through which the grievance is routed. Should all the intermediate steps in grievance procedure prove inadequate, mediation and arbitration may be provided as the final means of reaching an adequate decision. Much as many dislike to contemplate it, the trend toward arbitration as the final step seems to be fairly clearly defined. In dismissing grievance procedures with so little comment, it is not proposed to minimize the importance of providing

carefully thought out machinery. All recognize, however, that the procedure is a means to an end and not the end in itself. The best procedure will fail unless all concerned with it accept their responsibilities squarely and are sincere and honest in their efforts to fulfill them. Irresponsibility or lack of interest, or inattention at any level will weaken the whole fabric correspondingly.

Thus, in the final analysis, the successful handling of grievances and indeed of successful labor relations in all of its aspects must depend upon the attitude of the management personnel concerned. Assuming that policies have been defined and clearly established and that supervisors know the areas of their responsibility and authority, most labor relations problems enumerated so far, and specifically the handling of grievances, can be met squarely by the supervisors if they recognize and understand the accepted techniques for adjusting personal differences. Although it may be argued that the gift of handling people is intuitive to some degree, it should be stressed also that in its initial stages it is essentially a form of interview. The supervisor should know how to get people to talk clearly and freely about the matters which are troubling them and how to interpret what they say.

Interviewing Techniques

Because of the importance of the interviewing technique, the author would like to comment about it, not in full detail, but sufficiently to indicate a few basic principles.

First, the supervisor should learn to listen. People cannot communicate to him unless he does. He should not interrupt because he wants full expression.

Second, he should give full attention to the aggrieved employee and be sincerely interested because this attitude alone will encourage confidence and expression.

Third, he should not argue or give advice until it is asked for.

Fourth, he should be listening not only to what the employee says but he should listen also for what he does not say or cannot make clear without help. The supervisor should consider and weigh what the speaker says in relation to the total situation and the employee may have to be drawn out so that he is clearly conscious of all relevant facts and situations.

Fifth, the supervisor should have the employee repeat all or parts of his story until the facts are clearly established.

Sixth, the supervisor should, at the close of the discussion, summarize the interview so that the employee is confident that his position is understood. Having obtained the facts, the supervisor should consider the employee's problem on its merits. He should avoid log rolling or horse trading which tend to make personal problems grow into group issues. He should not pass the buck but should make or get a decision and support that decision with the reasons "why." As he gives the decision he should do so with full knowledge and recognition of the employee's right to appeal it and he should be willing to help the employee carry his case further. If facts warrant such action he should be willing to modify his decision, or accept gracefully a reversal. In any event, the foreman should follow through with corrective action promptly and then at some later time assure himself that the decision was sound.

Above all, a good supervisor will keep his eyes and ears open for situations that need attention and will correct them before they become magnified and perhaps reach an explosive stage. Preventive supervision is in any case superior to the most effective technique of handling problems in the field of labor relations. Furthermore, a supervisor should not be criticized because grievances have originated in his department. Such criticism as may be warranted should be reserved for those cases in which the foreman has failed to handle a grievance properly.

There is, of course, much more that could be said concerning all the points which have been discussed. Each one could be the subject of a paper in itself. All that has been said may be summarized in a few simple thoughts. First, supervisors are concerned in one way or another with every phase of the industrial relations program because they are the administrators. Second, steps should be taken to crystallize basic personnel policies and administrative procedures so that the line organization may make the inevitable adjustments correctly. Finally, the development of attitudes and techniques so that supervisors can handle properly their many phases of human relations contacts involving complaints, grievances, and other problems of personal adjustment is essential if all activities in the labor relations program are to attain the basic objective—obtaining the cooperation of all employees so that the collective purposes of the organization will be realized fully.

TAPPI Notes

A. E. H. Fair is now president of the Alliance Paper Company, Merritton, Ont.

Milton Schreiber, formerly of the Flintkote Company, is now research chemist for the Dixie Cup Company, Easton, Pa.

Rudolph T. Greep, formerly of the Chemical Warfare Service, is now soda pulp mill superintendent for S. D. Warren Company, Cumberland Mills, Me.

Karl Patrick, formerly of the Canadian International Paper Co., is assistant director of research for Fraser Companies, Ltd., Campbellton, N. B.

Harold F. Ingalls, formerly of the Bedford Pulp and Paper Company, is now engineer for the Nichols Engineering and Research Corporation, 60 Wall Tower, New York, N. Y.

Peter C. Trucano, formerly of the United States Navy, is now a student at the Institute of Paper Chemistry, Appleton, Wis.

Charles M. Howell is now located at 1753 Wiley Street, R. D. 1, Hollywood, Fla.

Gordon A. Sutton, formerly of the St. Lawrence Paper Mills Company, is now chemist for the Lake St. John Power and Paper Company, Dolbeau, P. Q.

Robert W. Reed, formerly of the Eastman Kodak Company, is now paper consultant for the Ozalid Division, General Analine & Film Corporation, Johnson City, N. Y.

Milton J. Gordon, formerly of the United States Army, is now research chemist for Peter J. Schweitzer, Inc., Chrysler Building, New York, N. Y.

Fred Holt Jr., formerly of the U. S. Army, is now technical director for Brown Bridge Mills, Inc., Troy, Ohio.

The QMC Subsistence Research and Development Laboratory has been redesignated as the Quartermaster Food and Container Institute for the Armed Forces. Col. Charles S. Lawrence, QMC, is commanding officer.

Matthew F. Healy, Jr., formerly chemist, Champion Paper & Fibre Co., Canton, N. C., is now with the Rising Paper Co., Housatonic, Mass.

Problems of the Printer and How the Paper Industry Can Cooperate With Him*

By George H. Petersen[1]

The Printer Has His Problems

What I am going to say to you in the next half hour or so in regards to the Problems of the Printer and How the Paper Industry Can Cooperate With Him, comes as an observation and from practical experience in various printing plants that I have been associated with in the middle west before joining the S. D. Warren Co. a little over five years ago.

Since then I have visited a great many plants, both letterpress and offset mainly, and, have seen and heard many problems that confront the printer and, I can assure you, they were not all paper problems. But, I do want to mention, that when a printer encounters a paper problem, he stands to lose more production and more actual money than would be the case with any other allied printing problem he may have.

So, when speaking of the problems that the printer is beset with, obviously only those problems can be discussed that have to do with the paper he uses to print on.

In speaking of the printer, reference is made to the letterpress printer as well as the offset lithographer, both small and large; the big edition printer, the specialist and the commercial house.

Before going into the problems of the printer, involving the use of printing paper, let it not be overlooked that the printing industry is very highly competitive in their respective classifications of products, consequently, most of them have very efficient cost systems and produce their work on predetermined time schedules and, the length of time the various operations should take are worked out very methodically.

It is a common by-word among the average commercial printer that the pressroom is the key to the success of his business and any delays or loss of time that occur there are looked upon with a frown.

Consequently, the printer does everything he can to keep the wheels turning in his pressroom and when he gets stymied, the fumes generating therefrom can sometimes be very uncomfortable and embarrassing to some one.

It is a well known fact that the printing industry is a highly skilled craft and which is amply reflected in the products of the many classifications, but, it can also be rightly said that the printer is a *convertor* of various allied printing materials.

By the proper use (and this is where the craftsmanship comes in) of type, plates, ink and paper supplied him, a product is produced that everyone in the whole world can use, taking in all ages and peoples.

Of course, some printing establishment may make their own type, or make their own plates, or have their own cameras, or make their own inks, and, recently, some few make their own paper. Others go so far as to make some of their own presses. But, nevertheless, the end use is *type, plates, ink* and *paper,* which is converted very skillfully into mediums for the progress and posterity of mankind.

For those printers that purchase type, plates, ink and paper (and that group comprises the majority by far) it must be taken for granted that they expect such material to function properly and, in a manner that past experience of such use has set up a precedent that is the guidance of their present and future sales and promotion.

And they rightfully should do so, because that is good sound business ethics. Consequently, the expectant performance of such materials is relied upon with surety when reputable materials are purchased.

But when, during the performance period of any one such material, and in this case, we will refer specifically to paper, becomes cranky or refuses to coordinate with the mechanical units of the press or bindery machinery, there immediately is a slow-down of production and if this slow-down of production assumes such proportions as to effect the pre-estimated time for the particular operation, the operators will become concerned about their time limits, so consequently, they will report their encountered trouble to their superiors. That is as it should be.

A skid of paper humped on top like a camel's back will invariably prevent the feeding mechanism on a press of properly delivering a sheet down to the guides and grippers. It is true that in some instances by inserting a series of wooden wedges strategically around the outer edges, the top can be fairly well leveled out.

Then there is the skid load that has a decided dished in top, much like the old nag's back that has been retired to the pasture.

Also, there are occasions when shooks have to be inserted by the papermaker to level out the load. Although this correction makes the skid load look nice, nevertheless, it reduces the printing press operator's production, because, when the paper is run down to the shook, the operator has to stop his press, lower the lift on which the skid rests, pull out the shook, and then raise the lift again in position with the feeder. Usually some adjustments are necessary to the suction cups, combers and etc. Such unnecessary operations take time and at the expense of so many hundred or so many thousand sheets, depending on the length of time of delay and the speed of the press.

There are many kinds of curling—caused by many conditions both in the printing plant and in the paper mill. Also, there are torn sheets, wrinkles, calendar cuts and plasters.

There are clay lumps causing plate batters that not only tie up the presses but also result in costly plate repairs or remakes.

It is probably superfluous to enumerate all of the

* Presented before the American Pulp and Paper Mill Superintendents Association convention at Poland Spring, Monday, June 17, 1946.

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possible troublesome conditions of paper, because there is no doubt that you, as mill superintendents, know all about them. You also know the answers as to how to correct them or how to prevent them from forming.

The past four years have been very trying times for the papermaker to endeavor to produce paper of uniform quality and uniform performance. By the same token the printer had his problems and consequently, was very considerate whenever paper problems arose. But such conditions will not continue to exist and the printer is going to be more demanding.

In producing and supplying paper for the printer, the papermaker is not only manufacturing paper to sell but it is actually *tendering a service to the printer* through the medium of paper, so the printer can operate a business at a profit. (Repeat)

This tendering of a service to the printer is a train of thought that can make the papermaker realize more fully what its responsibilities really are to the printing industry, which would tend to automatically bring about the realization of the printer's viewpoint and his problems of manufacturing printed literature.

With the coming of more uniform raw papermaking materials and together with the exercising of careful and precise workmanship it will be possible to make paper that will run through a printing press, be it a sheet-fed press or a roll-fed press, without any difficulty or slow-down. Color and finish might be termed as secondary features.

Performance Important Too

Yes, it has been said that color and finish is what sells the paper, but that appears to be largely a paper salesman's point of view. If such a paper does not perform economically for the printer, then color and finish do not mean very much. Therefore, it seems that performance would be the uppermost requirement of a paper (and consistently too) and that color and finish is only an added feature or an embellishment identifying its maker.

I make this statement, however, with some qualification, because it may be said that paper without good finish is not conducive to quality printing. True, but, what good is high quality finish when the paper itself will not run through the press economically?

Performance then should be the uppermost requisite of printing paper, that kind of performance that will make the printer's job economical to run through his press; then the paper should have that kind of finish that will reproduce the quality the printer's customer expects and then there should be the color that put the grade at hand in its field and give brilliance and life to the printed image.

To bring about this realization of the printer's problems by the papermaker, there are some policies that could be practiced to create splendid coordinations.

For instance: a series of talks on printers' problems by a printer of broad and varied experience to small groups of coating and calendar stock operators and to guillotine cutters and packers, have been found to bring tremendous results in places where it has been tried. Every operator likes to know what the end use is of the product he produces and how the paper is handled and the processes it goes through in a printing plant. He then can produce his work better with such a vision of printing procedures.

These informal talks could be extended to such other groups, like department heads, in the mill that would benefit by them. They could be held in a centralized location during working hours.

With this I am reminded of a firm in the middle west, manufacturing laboratory cabinets and fixtures, and their unique policy was to have every department head spend a week with jobbers and salesmen, observe installations and attend at least one major meeting where bids were made and opened on laboratory installations by his company as well as competitors. The president of the company told me that from his experience, it was one of the best investments he could make, because it stepped up production as well as quality and above all, it made his key people appreciative of the problems their customers had.

Such a system could also work out well in other industries.

Opportunity to Learn

It seems that an awful lot could be gained if the key men and department heads in a paper mill could have the opportunity to see printing plants in operation and know something about the operation and function of the various types of printing presses and accessory equipment. Most such men are hungry for just such kind of knowledge, because it is the natural desire of every worker to do his work in a manner that will give satisfaction to the printer.

Feeding mechanicisms on printing presses, for instance, vary with each type of press, although the basic principal of operation and function is generally the same. They are designed and constructed to handle paper that presumably is flat but the nature of the unit is such that the tolerances are not too great in regards to wavy or humpy paper piles.

Then we have the human element that enters into the successful operation of a feeding unit and when it comes to improvising, when difficulties are encountered, some individuals succeed solving the problem better than others.

Therefore, it is so important to produce and deliver paper that can be run through the press with the least amount of inconvenience.

Just because one printer was able to handle a difficult lot of paper satisfactorily, it is not said that every other printer is lacking in ingenuity. Circumstances, shop conditions and the type of work can be very complex, consequently, there can be no forecast.

In speaking of printers, they might be classified into two types: commercial and the specialty house. The commercial printer might handle anything from a business card to a huge catalog, whereas the specialty house might concentrate on one kind of an item, let's say, greeting cards.

Every job the commercial house produces is tailor made and the specifications on each order vary considerably, which is an opportunity for many variables to creep in. The greeting card house, on the other hand, has reduced the number of their orders into a few general groups.

But, both types of printers have much in common with each other and that is they both use paper and probably very similar paper in some cases.

In either case, if paper quality and performance, and I want to put emphasis on performance, is not uniform from lot to lot, the printer is likely to run into difficulties.

Let me give you an example: John Doe, the printer, has been using Hannaberry Gloss (let's say it's a number two grade) on a number of jobs in the past. Also he has used the same ink each time. Each time

the paper performed excellently in the press and the affinity for ink was perfect. Consequently, a feeling of reliability was built up on Hannaberry Gloss, and every time John Doe would reorder that paper for the next job, or similar jobs, there was no doubt but what the paper would perform exactly the same as it did the last time. John Doe had begun to rely on Hannaberry Gloss and why shouldn't he have, it being a standard grade from a reliable mill.

There comes a time in the course of papermaking that a certain standard formula for a sheet of paper is changed slightly, either from the standpoint of necessity or for its improvement. Sometimes these slight changes require a little different manipulation of printing technique, such as softening of the ink, for example.

As I have mentioned before, the papermaker is really tendering a service to the printer in the form of supplying the most important material to the printer, and that is paper. Without paper the printer can not print. So the printer must rely on the papermaker for a product that will allow him to operate his plant economically and efficiently. Consequently, when a change is necessary in the formulation of a grade of paper, and the mill by predetermined tests found that some adjustments need to be made in the printing operation, the printer should be apprised of such printing requirements. That is rendering real service. Theoretically the papermaker should know exactly how to economically and efficiently print on his products.

All of the things I have mentioned here this morning are very fundamental and are not new to any of us, but we cannot be reminded too often of the cooperation necessary between the papermaker and the printer.

It's all very obvious that the printer should get a paper that will perform without trouble in his presses, that is, without mechanical trouble. He should have paper that has excellent affinity for ink and good reproduction properties of color and the image. He should be advised when changes take place so he can compensate for such changes accordingly in his printing processes.

Further cooperation with the printer can be affected in having informal talks to small groups of mill key men and important operators and department heads, of many of the printer's problems, concerning particularly the mechanical function of paper through the various types of printing presses. The importance can be stressed on the absolute necessity of having perfectly flat sheets for offset presses particularly; the function of various types of mechanical feeders and delivery accessories on presses; the need for uniform calendering; what clay lumps and etc. will do to a set of plates; and so on.

Any and all such information is of great benefit to the worker because it makes him realize the importance of those things that sometimes may not seem very important. It's an accumulation of the little things that gradually build up to sizeable aggravations.

The paper industry today is manufacturing better and finer paper than they ever have before and, during the abnormal period of the last four years, it has been nothing short of miraculous in the way high quality paper was produced. Discounting color and presence of dirt specks, I think paper, as a whole, has been printing better than ever before and whatever difficulties the paper industry has encountered, the printing industry has been very considerate when they ran into paper troubles in their printing plants.

The coming era of printing and with its many processes and adaptations of effects, the demand by the printer is going to be more exacting than ever, and with the greater demand for color and process printing it will require much closer cooperation to the finer details that the printer has to wrestle with and the real tendering of a service to the printer will be a sheet that presents no problem to print economically.

In conclusion, I want to express my thanks for having this opportunity to project to you some thoughts that may be food for some constructive thinking and planning along these lines, and my firm, the S. D. Warren Co., joins me in this.

If there are any questions that have popped into your minds, please do not hesitate to give them to me and I will try to answer them.

Maine-New Hampshire TAPPI To Meet

The following is the technical program of the TAPPI Maine-New Hampshire section meeting which will be held at Rangeley Lake, Maine:

Friday afternoon, June 28—"Semichemical Treatment of Mill Wood Waste by the Acid Sulphite Process," by George Nystrom, University of Maine, Orono, Maine; "A Study of Wetting Agents on the Acid Sulphite Digestion of Pine," by C. C. Chang, University of Maine, Orono, Maine; "Pulpwood as a Farm Crop," by Lewis C. Swain, University of New Hampshire, Durham, N. H.

Friday evening, June 28—"Pulp and Paper Developments at the Engineering Experiment Station, University of New Hampshire," by L. E. Seeley, Director; "The Department of Industrial Cooperation of the University of Maine," by Roy P. Whitney, Director; "Forestry Problems in Maine," by David H. Stevens, State Assessor.

Saturday morning, June 29—"The Starch Problem," a panel discussion headed by Clifford Patch, Chairman of the Maine-New Hampshire Section and technical director of the Eastern Corporation, Bangor, Maine; "Bleached Groundwood" by F. C. Goodwill.

Introduction to Emulsions

The Chemical Publishing Company has recently issued an "Introduction to Emulsions" by George M. Sutheim (315 pp. 5¾ x 8¾). This book is an elementary treatise on the subject and discusses the principles, properties, methods of preparation and practical applications of emulsions. A special feature is an extensive bibliography and an alphabetical list of emulsifying agents, giving trade names in current use, their chemical composition, the group to which they belong, the type of emulsion they help to produce and the name of the manufacturer.

It was written by a practical man for practical men. The emulsion field is a tricky one and much of the practice in this field is by the hit or miss method. The author originally presented this material in a course given at the Polytechnic Institute of Brooklyn. It will be a valuable book for many practical operators who are bewildered by the vast amount of conflicting information that has been published in various places on the subject.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $4.75 per copy.

Remote Control Engineering of Stock Preparation Equipment*

By J. W. Couture[1]

Abstract

Because of the slow development of the paper industry in regard to technical education, the value of complete intergration of all processes has not been fully recognized. However, the advent of engineers trained in paper manufacturing methods has made it possible to introduce processing by remote control. A system for stock preparation is given as an example.

Down through the centuries since man first started making paper, changes in processing were slow in coming and exceedingly far apart. In all this time, papermaking was considered an art and can in no way yet be considered to be an exact science.

The men who make paper have been artists and most of them have the artist's temperament in that they believe paper can be made in one way only, and that in their own particular system. Witness the making of facial tissue even as relatively noncomplex an operation as this, noncomplex only in its relationship to other kinds of paper, leaves one with the astounding fact that in all facial mills in the country, no two sets of equipment are alike, and that each and every papermaker feels his own particular hookup is by far the best.

Technical Education

In the last few years there has been in the paper industry a definite trend towards the gathering of technical and engineering information duly written up and bound in volumes, so that the knowledge gained by the various men in the industry is saved and passed along to the following generation. A tremendous amount of credit must be given to the farseeing men who, against difficult and at times insurmountable odds, produced the superintendents as well as the TAPPI organization.

With the advent of papermaking courses in the well-known colleges such as the New York State College of Forestry; University of Maine—School of Forestry; The Institute of Paper Chemistry—a graduate school specializing in advanced degrees in the science of paper making, many paper mills, as well as affiliated companies, recognized the necessity for more technological help. As surely as coming events cast their shadows before them, so, too, the place of the engineer with a degree in the science of papermaking is assured. The allied industries have had to meet with this type of individual in charge of a paper mill who knows the detailed reasons for various phenomena, which had been known in papermaking. But never fully understood, and as a result, the trade itself has benefited immensely.

The business of papermaking is the fifth largest in this country, but until recently, in the matter of technological help, was practically at the bottom of the list. Furthermore, the equipment manufacturers themselves were partly to blame for this condition in that their equipment was not designed for remote control or consolidation with other equipment. However, recently, the benefit of remote control is being more clearly understood and appreciated by the paper mill technical staff who now require this feature, not as a luxury, but as a full necessity.

Control

In the immediate past, at least, if not in the actual present, every piece of equipment in the paper mill was run individually, and all starters, push-button stations, etc., were decentralized. This meant that each piece of equipment had to have at least one operator, and most of the time, this operator had no idea of what the man next to him, on a piece of equipment which might be in the same system, was doing. True, the man at the top had the complete overall picture, but he was the only one. The trend now, however, is towards centralization, and the recent thinking—at least in the author's organization—has crystallized so far as to make it possible and practical to operate a complete stock preparation system from one main panel board, necessitating one operator only.

This operator has to be an individual of high intelligence as opposed to the ordinary beater room help, and he must be treated as such. One of the great faults of the past was the fact that the paper industry was practically forced to hire the cheapest type of help available. It is well known that paper mills have the greatest investment per ton of production of any kind of manufacturing concern, yet all this expensive equipment was operated by rather poor help. As an example, when a change was made from plain to intricate antifriction type bearings requiring fits of ± thousandths of an inch, the mechanics on the job were found to be the same. This should not make good sense from management's viewpoint.

Along with many others, the author's company has recognized the meaning and full importance of this state of affairs, and for many years, has tried to bring about a more orderly and scientific approach to the art of papermaking. For instance, it was recognized that a beater, as well as it performed in the past, had three distinct jobs to perform: defibering baled stock and laps; refining fibers; and blending fibers, color, alum, clay and any other ingredient which an individual operator might require.

Stock Preparation System

Obviously, the beater could perform only one of the above jobs efficiently, and the other two were inefficiently done. This thinking led to the Hydrafiner, which in turn, brought about the Hydrapulper and thence the Hydracycling tanks.

Describing each a little further in order to amplify the reasons for remote control, the following remarks

*Presented at the meeting of the American Pulp and Paper Mill Superintendents Association held at the Poland Spring House, Poland, Me., June 18, 1946.

[1]Engineer, Dilts Machine Works, Fulton, N. Y.

are pertinent: The pulper is a piece of slushing equipment. For this job, it will perform far more satisfactorily than a beater. It cannot, however, refine. Therefore, the power is used efficiently for one purpose only—slushing. The refiner will not slush nor will it mix or cut, the latter being left for the jordan; however, the power used for refining and hydration is expanded at top efficiency.

The cycling tank, due to its unique design, does two distinct jobs: Blending—refining; when blending, the propeller agitator is in motion, the refiner is shut down; when refining, the reverse is true; thus the horse power expended is used for the sole purpose for which it is intended. The cycling tank lends itself for the purpose of evening out consistency variations. This ability is on of its chief characteristics.

It will be noted in the above paragraph, the refiner is used for hydration and cutting is held to a minimum. When cutting is required, it is done by the jordan. This hookup allows controlled hydration and cutting so that the type of sheet required is always at the operator's finger-tips.

The integration of these various units is necessary if each is to perform its function in an efficient manner and to provide the paper machine with the right type of stock for the grade of paper which it is desired to make. Such a system has been described by R. T. Vokes in a paper presented at the 1944 Annual Meeting of the Technical Association entitled "Stock Preparation at J. R. Booth Limited." Some very revealing and interesting facts were pointed out, one of the most important being that management can determine the tonnage passed through the stock preparation system at any time they so desire.

It is believed that the advantages of centralized controlling of the system can perhaps be best described as follows:

1. Physical effort is reduced to a minimum and the operator can concentrate mentally on the task of producting a uniform stock. He stays in one place and does not have to move from place to place. Everything is in sight.

2. The character of the work interests a type of thinking worker who would not be satisfied to do heavy manual labor. The training period is short because no dependence is required on log beating experience.

3. The vigilance of the operator is kept high —otherwise the records will show any irregularity in his operation.

4. The tour supervisor can spend less time in the stock preparation because when the inspection is made, he can quickly see what is going on and what has gone on during his absence due to the recording instruments on a panel board.

5. The top staff on days have a good record of the operation and in the case of trouble or a non-standard production, can reconstruct the chain of events leading up to the difficulty and are thus able to take the most direct method of preventing a recurrence.

6. Labor costs are kept at a minimum, usually one-third to one-half of what they would be in an orthodox beater room. This one item alone shows the amortization of the cost of a panel board and instruments, is directly related to labor saving and considering that an investment of upwards of $50,000 is justified when saving the labor cost of one man around the clock. This, alone, would take care of the initial investment of even the most complicated control panel installation. In addition to this, the investment pays 100% return on the labor saving, year in and year out.

7. Accident hazard becomes negligible, which, in turn, is reflected in better employee morale.

8. It is much more readily possible to make a good sheet and then reproduce it months later.

9. The instrumentation which is part of the remote controlling serves as a silent watchdobby on many factors, both before and after the stock preparation system and often shows up an irregular tendency in sufficient time to avoid subsequent trouble.

The hodge-podge method of control, so prevalent in the immediate past, is now being replaced by centralization, which it is believed represents a most modern and compact process plant, thus engineering to an exceedingly high degree the remote control of stock preparation equipment.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Juan A. Arevalo, Chief Chemist of the Paper Mill Laboratory, Sociedad Agricola Paramonga Ltda., W. R. Grace & Co., Supe, Peru. Attended San Marcos College, Lima.

Leslie G. Cottrall, Chief of Technical Division, Albert E. Reed & Co., Ltd., Aylesford Paper Mills, Larkfield, Kent, England, a 1913 graduate of King's College, London University. Chairman, Technical Section of Paper Makers Association of Great Britain and Ireland, London, England.

Roberto S. Fernandez, Head of Research Dept., Tecnica Industrial, S. A., Monterrey, N. L., Mexico, a 1937 graduate of Tulane University.

Walter L. Hardy, General Manager, Protective Coatings Corp., Belleville, New Jersey, a 1938 graduate of Cornell University.

Frederick P. Heil, Chemist, Lockport Felt Co., Newfane, New York, a 1939 graduate of the New York State College of Forestry.

James J. Higgins, Student, Institute of Paper Chemistry, Appleton, Wisconsin, a 1942 graduate of Ohio State University.

Henry J. Kellogg, Church Street, Copake, New York, a 1905 graduate of Harvard University.

Rutger Larson, Production Manager, Paper Mill, A/B Stjernfors, Stalldalen, Sweden, a 1941 graduate of the Royal College of Technology.

Earling B. Marum, Research Chemist, The Solvay Process Co., Solvay, New York, a 1929 graduate of the Technical Institute of Dresden.

Walter L. Savell, Director of Chemical Research, Remington-Rand, Inc., Laboratory of Advanced Engineering, South Norwalk, Connecticut, a 1912 graduate of the University of Georgia.

Tsong-chi Sheng, c/o Tze-chen Sheng, Deputy Postal Commissioner, Kweiyang, China, a 1940 graduate of the University of Nanking, and a 1945 graduate of Yale University.

Hsien Wang, Engineer, Hsiun-San Paper and Pulp Co., Kueiki, Kiangshi, China, a 1938 graduate of Checkiang University.

Nils V. Wegner, Chief Engineer, Hellefors Bruns A/B, Fredriksberg, Sweden, a 1919 graduate of Royal Technical University.

Harvey A. Whitenight, Chemist, Reilly-Whiteman-Walton Co., Conshohocken, Pennsylvania, a 1932 graduate of Lehigh University.

Lubrication of Antifriction Bearings*

By D. T. Achorn[1]

Abstract

The function and basic principle in the selection and application of lubricants for antifriction bearings are presented.

Early applications of *rolling motion* principles date back to the time when man first rolled large stones to the edge of a cliff to drop them on the heads of some unsuspecting enemy. History tells us of the use of rollers to move large masses of stone—as in the construction of the pyramids of Egypt. One of the early important victories of man over friction was brought about by the invention of the wheel. The first wheel was probably a cross-sectional slice of a tree trunk mounted on a crude wooden axle.

About 1890 bicycle riding became a national pastime and then the attention of many people was centered on the job of reducing the effort necessary to move oneself and the bicycle. In this way antifriction bearings became popular on a mass transportation vehicle. The automobile, however, provided the big opportunity for antifriction bearings, and it is safe to say the present "know how" of bearing manufacture has been greatly promoted by the automobile industry.

Ball and roller bearings are called "antifriction" bearings because of the fact that they offer less resistance to starting motion than do plain bearings. The *theoretical* operation of antifriction bearings involves a motion of purely rolling nature.

The actual operation of antifriction bearings, under load, involves both rolling and sliding motions. The sliding motions are brought about by the slight deformation of the balls or rollers and their raceways, together with the sliding contact which exists between the separator or cage and the rolling elements.

Upon examination of a typical antifriction bearing, there are the following component parts:

The outer ring with the accurately ground and lapped raceway; the inner ring with its accurately ground and lapped raceway; a set of precision-made balls where diameter variation limits of balls are in the magnitude of 0.00005 inch; and an accurately made separator or cage designed to space the balls or rollers in the bearing.

In the operation of antifriction bearings, lubrication is of outstanding importance.

The function of lubricants in antifriction bearings may be summarized as follows:

Protect the accurately ground and highly polished surfaces from rusting and corrosion; minimize the friction resulting from the contact and slippage between the moving parts; minimize metallic contact between the moving elements and their raceways; aid in dissipation of heat; and aid in sealing the bearing against the entrance of contaminants.

The following characteristics are required of a lubricating oil for antifriction bearings:

High chemical stability is necessary to prevent the formation of deposits or acidic materials, which would destroy bearing surfaces; good demusibility or water separating characteristic, particularly when bearings are lubricated from a circulating system; proper viscosity for the operating speeds and temperatures; good antiwear or film strength characteristics are particularly important when heavy or shock loads are encountered; and adequate adhesiveness for protection during idleness.

Grease Lubrication

Under certain conditions, the plastic nature of a soap-thickened oil is preferable to the fluidity of the lubricating oil itself. Such a mixture of oil and soap constitutes a grease and the resulting lubricant is capable of forming a plastic film, thus minimizing friction, wear, power consumption, leakage, etc., under more or less unfavorable or mechanical conditions.

There are several classes of service where grease is generally recommended.

1. Where mechanical design (sometimes accompanied by high operating temperatures) would result in excessive oil leakage, high oil consumption and, in certain industries, contamination or staining of the finished product.

2. Where mechanical design does not prevent the entrance of grit or water into the lubricating areas. Correctly selected greases provide a partial seal and help prevent wear.

3. Where application of lubricant is infrequent or hazardous, due to the number of bearings and their inaccessibility.

4. Where low operating speeds and heavy pressures hinder the ready formation and continued maintenance of adequate separating films.

Characteristics of a satisfactory grease may be summarized as follows:

Uniformity, purity, stability, correct consistency under operating conditions, and suitable behavior in presence of moisture or water.

The three most common types of grease are:

Lime base, soda base, and metallic base (Al, Ph, Li).

When selecting a type of grease for service, the following operating conditions should be considered:

Agitation; length of service; operating temperatures; water, moisture; and excessive throw or leakage.

Cleanliness is a "must" in the handling and storage of grease. Dust, dirt and contamination promote failure of bearings. Grease passages become clogged and prevent grease from reaching the bearings. Ball and roller bearings with their fine finish and precision fit become pitted and fail if dirt particles get in between the highly polished races and the balls or rollers.

Packing of Ball and Roller Bearings

Improper grease packing of ball and roller bearings is one of the most common causes of over-heating

*Presented at the meeting of the American Pulp and Paper Mill Superintendents Association held at Poland Springs House, Poland, Me., June 17, 1946.

[1]Socony-Vacuum Oil Co., Cambridge, Mass.

and failure. If the bearing space is completely filled with grease, the balls or rollers have to force their way through it. Properly packed antifriction bearings will often save enough power costs to pay the lubricating cost.

Grease Seals

Most antifriction bearing housings are made with tight seals. Forcing grease into them under high pressure with a grease gun may burst the seals. When the seals are once ruined, the bearing will leak until the seals are repaired. Many leaky bearings are caused by careless greasing. With correct grease and tight seals, many bearings need only to be greased twice a year, and for some types of operation this period may be longer. With poor or broken seals, constant checking is required, more grease is consumed and more grease comes out.

In such locations as in electric motors where grease can get on the windings and cause deterioration, or when grease can get on the product being manufactured, this carelessness may well be a vital factor.

A properly greased ball or roller bearing should be about one-third full in the bearing space. The grease in the sealing space is not in contact with the running balls or rollers and this space should be full.

Since the capacity of many bearings is seldom known by the user, it is difficult to measure the correct quantity to be fed to each bearing. The most practical method is to remove the drain plug, pump new grease in at the grease fittings until it comes out at the drain plug, then run the bearing for about 5 minutes. This permits the bearing to force out all the excess grease. The drain plug should then be replaced.

With tight seals, normal temperatures, and the correct grease, many bearings may then be regreased at 4 to 6 month intervals. This takes time to do properly —on the other hand improper packing may require daily care and take up much more time in the long run.

Use of improper lubricants: Most plants require more than one type of grease for antifriction bearing lubrication. Use of the wrong type of grease in a bearing may result in one or more of the following results:

Leakage, breakdown of lubricant, corrosion of bearing parts, stalled bearings, and bearing damage.

The most practical way to prevent such misuse of lubricants is to have only properly trained personnel handling lubricants. Frequently different types of fittings are used on bearings requiring different types of grease. By using only one type grease in a gun, which is properly marked, and equipped with the correct coupling to correspond with the bearing fittings—many misuses of grease may be avoided.

A good lubricating program is a sound investment. Experience indicates that when establishing such a program it becomes most effective to have on person set up and be responsible for the entire program. Equally important is the selection and training of dependable personnel to carry on a well organized program of correct lubrication.

Correct Lublication may be stated as: The right lubricant—applied in the right way in the right amount, at the right time.

Mildewproofing of Paper Mill Felts*

By Frederic A. Soderberg[1]

Abstract

During the war it was found that dihydroxydichlordiphenylmethane was of value in preventing mildew on military equipment. Investigation showed that it could be applied to papermakers' felts and that in preventing the growth of fungi and bacteria which produce mildew it increased felt life. It is also a mothproofing agent.

The method of preparation and application of this agent to machine felts is given and typical mill results are noted.

Suppliers of dyestuffs and related chemicals to the armed forces during the war became vitally interested in the mildew-proofing of military clothing and equipment. Government officials had found that untreated cotton sent to the South Pacific in the form of webbing, gas masks, tents, and clothing mildewed in a short space of time. One of the last articles written by Ernie Pyle mentioned the effect of mildew upon clothing. As the aircraft carrier on which he was traveling sailed toward Okinawa, the temperature dropped abruptly. It was decided to bring out heavy underwear for the officers and crew of the ship. When this was done, they found that every piece was covered with mildew; however, after several washings, everyone aboard donned the long underwear. Pyle related that the captain of the ship was warm but extremely uncomfortable because of the odor which remained in the material.

An extensive investigation was conducted at the Jeffersonville Quartermaster Depot to find a chemical which would mildewproof cotton and be fast to the leaching action of the torrential South Pacific rains. In a report made by E. C. Bertolet, Chief Chemist at Jeffersonville, he stated that a water repellent 9.85 duck, vat dyed olive drab No. 4 containing 1% dihydroxydichlordiphenylmethane (Preventol GD) was buried in moist earth for 7, 14, and 21 days before and after leaching with little loss in tensile strength. Mercuric compounds investigated at the same time gave inconsistent results and almost complete loss of fiber strength at the end of 21 days. These tests were later substantiated by practical application of thousands of pounds of the organic agent under direct government allocation.

For years the general dyestuff paper laboratory had been troubled by the deterioration of felt squares used to press water out of lyeings. After prolonged

*Presented at the meeting of the American Pulp and Paper Mill Superintendents Association held at Poland Spring House, Poland, Me., June 18, 1946.

[1]Head of Paper Dept. General Dyestuff Corp. New York, N. Y.

service, these felts became harsh to the touch and holes appeared. Because of the excellent results with cotton, it was considered possible that the agent might also immunize wool. To prove this point, thirty-six, 12-inch squares were cut from a new felt. Twelve were impregnated with 1% dihydroxydichlordiphenylmethane, twelve with a mercuric compound, and twelve were left untreated. After a period of constant use, the untreated and mercuric treated felts became harsh, lost tensile strength, and holes appeared in the area which contacted the paper dyeings. Those impregnated with the organic chemical were soft, maintained their original tensile strength, and no evidence of mildew action was apparent.

Practical Mill Trials

The next step, naturally, was to select a mill where extreme felt loss had been encountered and where it was definitely established that biological rot was responsible. Fortunately, at this particular time one of the plants in the midwest was desperately in need of something which would render their felts impervious to mildew. A trial application on one of their machines resulted in an increase of felt life from 6 days to 22 and 28 days on blankets from the same manufacturer used in rotation. In order to satisfy himself regarding the effectiveness of this product, the superintendent ran the next felt without treatment, however it was necessary to remove it after 6 days of operating time. The records of several mills manufacturing diversified products may be of interest.

CASE I (Specialty Mill)

A study of the running time of untreated felts during the summer months pdoduced these averages:
April 22 days, May 18 days, June 4 days, July 5 days, and August 6 days.
Treated felts were then placed on two machines with the following results:
August 28 days, and August 22 days (defective press roll).
The management decided to treat all felts on one machine and found that where fifteen felts were used in 1944 only seven were required in 1945.

CASE II (Yankee Machine Mill)

Machine A	
Bottom Felt	
Untreated ..	9.8 days
Mercuric treated	19.6 days
Dihydroxydichlordiphenylmethane	24.0 days
Top Felt	
Untreated	32.2 days
Machine B	
Dihydroxydichlordiphenylmethane treated	41.4 days
Untreated	19 days
Mercuric treated	18 days

CASE III (Board Mill)

Several bottom felts were impregnated:

Average untreated	7.5 days
Average treated with the organic agent	11.3 days

CASE IV (Tissue Mill)

Increase in felt life when preventative agent was used:

Twelve-month period	22.0%
May to October	34.0%

Origin of Mildew

The organisms which cause felt deterioration are generally found in the water supply or in the air around the machine. Authorities on this subject agree that certain types of bacteria are present in nearly all water supplies while fungus spores are always in the surrounding air. When the temperature rises or other changes take place, the bacteria and fungi become active and start to develop. It is also true that many of the materials used in paper manufacture collect on the felts and form excellent feeding grounds for these growths. Slime which may be found in other parts of the system often breaks away and is deposited upon the felt. In the absence of any treatment, these colonies continue to grow and lower the efficiency of the press operation.

Do not be misled into believing that mildew action is not taking place simply because green or brown patches do not appear on the surface of the felt. The action of these organisms upon the individual felt fibers gradually decreases their tensile strength until complete disintegration occurs. A rip or a tear which might otherwise be attributed to mechanical wear or faulty manufacture can be caused by invisible mildew action. One of the most interesting applications of this product occured in a plant where the management was certain that mildew was non-existent. The treatment of all their felts on one machine during a period of 7 months gave them a bonafide increase in felt life of over 20%.

Preparation and Application

The methods of preparation and application generally employed are fairly simple and should not disrupt mill procedure or inconvenience the operating personnel. A solution of the chemical is applied to a new felt after the latter has been shrunk into position. This may be done by means of a. dipper, spray pipe, or immersion of the felt. By forming a pond directly before the press roll, complete impregnation can be obtained. This treatment is followed by a weak solution of acid which serves to precipitate the dihydroxydichlordiphenylmethane on the wool. The usual papermaking operations then continue without further interruptions. Inherent resistance of this product to leaching, which was previously mentioned, will, under ordinary conditions, insure protection throughout the normal life of the blanket. The agent is nontoxic, nonirritating, and does not hydrolyze at high temperatures. These features are extremely important to those in the production end of the paper industry who must constantly endeavor to eliminate operational hazards.

Mothproofing

Quite apart from the question of mildewproofing, dihydroxydichlordiphenlmethane has demonstrated excellent protection against the attack of moths. Preliminary tests show that woolen felts containing approximately 2% of this material based on the dry weight of wool, become immune to the depredations of moths and carpet beetles. While mothproofing is of little interest once the felt has been placed in position on the machine, it is decidedly worthwhile whenever it becomes necessary to store felts for a long period of time.

Summary

One question that is always uppermost in the minds of mill men, is that of cost. The procedure which has been outlined entails the expenditure of less than 3 dollars per 100 pounds of felt. Very little figuring is required to estimate the slight increase in felt life necessary to absorb that amount, particularly when one application is generally sufficient for satisfactory immunization. Probably the best summation of this subject is contained in a direct quotation.

"We continue to apply Preventol GD to each new felt when starting up, whether it is needed or not. The management considers it excellent insurance against damage by bacterial action which may develop suddenly at any time."

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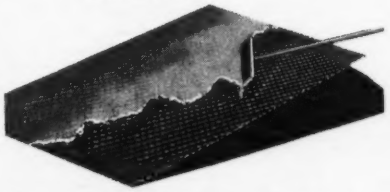

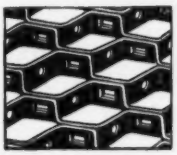

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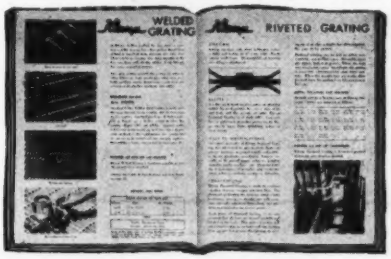

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NEW YORK IMPORTS

WEEK ENDING JUNE 15, 1946

SUMMARY

Newsprint	22,984 rolls
Photo Base Paper	104 cs.
Drawing Paper	5 cs.
Filter Paper	20 cs.
Decalcomania Paper	75 cs.
Decalcomanias	3 cs.
Carbon Paper	1 crt.
Parchment Paper	1 cs.
Transfer Tissue Paper	25 drums

NEWSPRINT

Hearst Enterprises, Inc., Buckeye State, Three Rivers, Que., 2340 rolls.

International Paper Co., International No. 1, Gatineau, Que., 307 rolls.

H. G. Craig Co., Kermic, Donnacona, Que., 382 rolls.

News Syndicate Co., Wellington Park, Baie Comeau, Que., 7917 rolls.

H. G. Craig Co., G.D.D., Donnacona, Que., 349 rolls.

World Telegram, Cornerbrook, Cornerbrook, N. F., 1290 rolls.

N. Y. Sun, Cornerbrook, Cornerbrook, N. F., 1510 rolls.

Clinton Paper Corp., Cornerbrook, Cornerbrook, N. F., 2422 rolls.

Tenafly Printing Corp., Cornerbrook, Cornerbrook, N. F., 180 rolls.

Evening Bulletin, Cornerbrook, Cornerbrook, N. F., 1797 rolls.

H. G. Craig, A.C.D., Donnacona, Que., 392 rolls.

Montgomery Paper Co., Gudrun Maersk, Botwood, N. F., 3752 rolls.

H. G. Craig Co., Donpaco, Donnacona, Que., 346 rolls.

PHOTO BASE PAPER

Intercontinental Forwarding Co., Waltham Victory, London, 104 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Waltham Victory, London, 5 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Waltham Victory, London, 20 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Winthrop L. Marvin, Liverpool, 32 cs. (duplex), 7 cs. (simplex).

B. F. Drakenfeld & Co., R. J. Reynolds, Liverpool, 36 cs. (duplex).

DECALCOMANIAS

Sellers Transportation Co., Inc., R. J. Reynolds, Liverpool, 3 cs. (Ceramic transfers).

CARBON PAPER

Mynol Chemical Co., Boston City, Bristol, 1 crt.

PARCHMENT PAPER

Andrews Paper Co., Waltham Victory, London, 1 cs.

TRANSFER TISSUE PAPER

B. F. Drakenfeld & Co., Winthrop L. Marvin, Liverpool, 25 drums.

RAGS, BAGGINGS, ETC.

National City Bank, Boston City, Bristol, 539 bls. paperstock.

Tradesmans National Bank Trust Co., Boston City, Bristol, 269 bls. paperstock.

American Express Co., Boston City, Bristol, 18 bls. wool rags; 5 bls. threadwaste.

(———), Boston City, Bristol, 61 bls. woolen rags; 26 bls. threadwaste; 16 bls. wool waste; 13 bls. old rags; 71 bls. new wool rags.

Williamson Products Co., New Rochelle Victory, Buenos Aires, 252 bls. cotton waste.

(———), Argentina, Copenhagen, 31 pkgs. wastepaper.

U. S. Commercial Co., Stephen Johnson Field, Istanbul, 1382 bls. new cotton clippings.

E. J. Keller Co., Inc., Stephen Johnson Field, Alexandria, 35 bls. linsey garments; 134 bls. old colored cotton rags.

R. Blank, Stephen Johnson Field, Alexandria, 67 bls. old white cotton rags.

E. J. Keller Co., Inc., Stephen Johnson Field, Alexandria, 334 bls. Hessian burlap strips; 163 bls. cotton waste; 142 bls. old white cottons; 17 bls. old canvas; 136 bls. old colored cottons; 99 bls. Hessian jute bagging.

Continental Bank Trust Co., Stephen Johnson Field, Alexandria, 151 bls. cotton rags.

Textile & Paper Supply Corp., Stephen Johnson Field, Alexandria, 68 bls. cotton waste.

Castle & Overton, Inc., Stephen Johnson Field, Alexandria, 153 bls. old colored cotton rags; 79 bls. old white rags.

Tradesmans National Bank Trust Co., Waltham Victory, London, 162 bls. rags.

A. Bloch & Co., Winthrop L. Marvin, Liverpool, 101 bls. new cotton cuttings.

Amtorg Trading Corp., Chelyuskinetz, Libava, 2804 bls. cotton linters.

Amtorg Trading Corp., Chelyuskinetz, Riga, 4910 bls. cotton waste; 5092 bls. cotton linters.

Public National Bank, Fort Miami, Rio de Janeiro, 62 bls. cotton waste.

Cowa & Co., Fort Miami, Rio de Janiero, 93 bls. cotton picker waste; 50 bls. cotton fly waste; 31 bls. cotton waste.

(———), James J. Hill, Glasgow, 45 bls. old mixed rags; 54 bls. old jute bagging.

Tradesmans National Bank Trust Co., James J. Hill, Glasgow, 833 bls. old webbing.

National City Bank, James J. Hill, Glasgow, 160 bls. paperstock.

(———), City of Agra, Melbourne, 36 bls. wool waste & rags.

E. Butterworth & Co., Inc., R. J. Raynolds, Liverpool, 99 bls. cotton waste, old rope, etc.

P. J. Schweitzer, Fair Wind, Calcutta, 315 bls. old hemp rope cuttings.

W. Steck & Co., R. J. Reynolds, Liverpool, 340 bls. old strings.

CASEIN

American British Chemical Supplies, Inc., New Rochelle Victory, Buenos Aires, 3982 bags ground lactic casein.

F. H. Paul & Stein Bros., New Rochelle Victory, Buenos Aires, 500 bags lactic casein.

(———) Fort Miami, Buenos Aires, 1000 bags lactic casein.

GLUESTOCK, ETC.

Transatlantic Animal By-Products, Inc., New Rochelle Victory, Buenos Aires, 900 bags bone glue; 400 bags hide glue.

Wessel Duval & Co., New Rochelle Victory, Buenos Aires, 100 bags bone glue.

1st National Bank, Cinch Knot, Havana, 53 bls. gluestock.

J. Gorvers, Cinch Knot, Havana, 121 bls. gluestock.

Transatlantic Animal By-Products, Greece Victory, Valparaiso, 399 bags glue.

E. Butterworth & Co., Inc., R. J. Reynolds, Liverpool, 104 bags old pickers; 89 bags hidecuttings.

WOODPULP

Pulp Sales Corp., Ragnhildsholm, Rauma, 2068 bls. bleached sulphite pulp; 2325 bls. unbleached sulphite pulp; 3609 bls. unbleached sulphate pulp.

Acer & Co., Cornerbrook, Cornerbrook, N. F., 3150 bls. sulphite pulp.

Pagel Horton & Co., Inc., Rider Victory, Gefle, 3620 bls. woodpulp, 724 tons; 3556 bls. unbleached woodpulp, 710 tons.

Pagel Horton & Co., Inc., Rider Victory, Hornefors, 915 bls. dry sulphite pulp, 150 tons.

Pagel Horton & Co., Inc., Rider Victory, Husum, 2438 bls. dry sulphate pulp, 406 tons.

WOODPULP BOARDS

Jay Madden Corp., Ragnhildsholm, Rauma, 508 rolls.

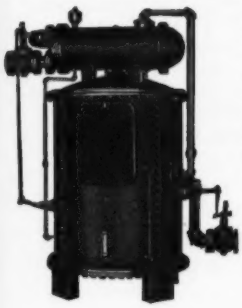
Production Lags in Italy

WASHINGTON—Nearly 90 per cent of the paper mills in central and southern Italy were in operation early in 1946, according to a report to the Department of Commerce. Production was at a low rate, however, due to a shortage of all basic supplies required. Only low grade waste paper was being utilized.

THERE'S A STICKLE FEED WATER HEATER FOR ANY PAPER MILL

To Heat Water to Higher Temperature in Less Space. Open Coil design brings raw make-up water into direct contact with steam, making transfer to heat from steam to water instantaneous. Feed water delivered to pump within two degrees of temperature of saturated steam in heater.

To Purify Water for Boiler Feed. Scale-forming substances and injurious gases are removed from raw make-up water. Fully one-sixth boiler feed supply distilled water—steam condensed in heating.

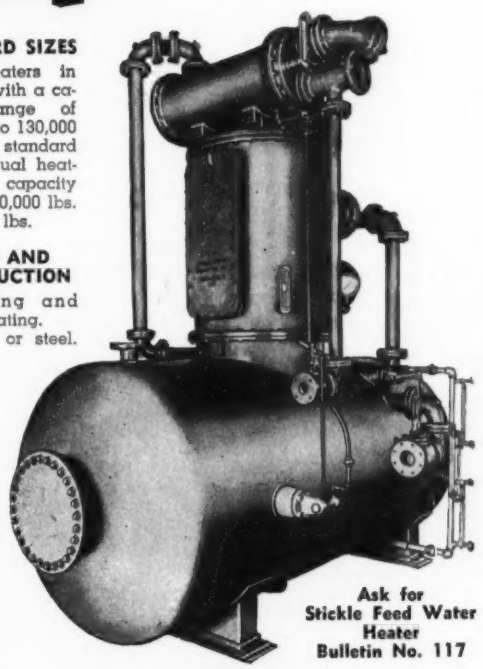


To Require Little Attention. Admission and overflow automatically controlled. Scale-forming substance does not accumulate on side walls. Water does not overflow trays. Trays easily removed and replaced.

To Give Long Service Life. Both design and construction contribute to extra years of efficient service and little or no repairs.

STANDARD SIZES
Single heaters in ten sizes with a capacity range of 3,000 lbs. to 130,000 lbs. Six standard sizes of Dual heaters with capacity range of 30,000 lbs. to 250,000 lbs.

TYPES AND CONSTRUCTION
Deaerating and Non-deaerating.
Cast iron or steel.



Ask for Stickle Feed Water Heater Bulletin No. 117

STICKLE
STEAM SPECIALTIES COMPANY
2215 Valley Ave., INDIANAPOLIS 1, INDIANA

OTHER EQUIPMENT FOR PAPER MILLS

Stickle Drainage and Control—a complete system that increases efficiency and reduces cost of paper drying. Adaptable to specific operating conditions. Bulletin No. 260.

Stickle Open Float Steam Traps—in designs and capacities for all drainage requirements. Bulletins Nos. 115, 315 and 415.

Stickle Regulating and Reducing Valves—especially designed to meet paper mill demands for accuracy, sensitivity and dependability. Bulletins Nos. 235 and 435.

Leading the Parade

• Starches, Gums, Syrup and Dextrines made by CORN PRODUCTS solve many manufacturing problems. CORN PRODUCTS technical staff is at your service to assist you in making efficient, economical use of these fine products.

Corn Products Sales Co.
17 BATTERY PLACE, NEW YORK 4, N. Y.

Week's Record of Trends in The Paper and Pulp Market

Office of the PAPER TRADE JOURNAL,
Wednesday, June 19, 1946

Current trade estimates indicate that paper and paperboard production will reach 18,500,000 tons in 1946. Steady improvement in supplies of fibrous raw materials is holding production at higher levels than had been anticipated earlier in the year. Pulpwood inventories have increased a half a million cords over the end of March last year. At the same time wood pulp inventories at paper and paperboard mills have been maintained at higher than anticipated levels as a result of the high domestic pulp output during March and April and the heavy volume of waste paper collections since the start of the year. The largest gains are expected to come in newsprint and white paper, including specialty papers.

Price increases in the paper industry are looked upon as a mixed blessing, but as long as general costs are increasing further advances in wood pulp, white paper, newsprint and the neglected kraft paper products seem inevitable. The twofold problem facing the paper industry today is how to meet record demands without the repetition of the disastrous over-expansion as experienced by the newsprint people in the early 20's. Non-integrated mills will require special attention since the recent advance of wood pulp prices have pinched their profit margins because paper products were not given corresponding increases. With most of the major companies planning to increase their capacities this year, the industry as a whole is expected to reach a capacity of close to 20,000,000 tons of paper and paperboard in 1947. Paradoxically, there remains the prospect of a tight market in paper and pulp which may easily continue for the next three years.

The index of general business activity for the week ended June 8 rose to 125.9 from 116.0 in the previous week, compared with 142.8 for the corresponding week in 1945. The index of paperboard production rose to 167.9 from 164.7 in the previous week, compared with 166.5 for the corresponding week in 1945.

Paper production for the week ended June 8 was estimated at 104.0 per cent, compared with 96.3 for the preceding week, with 92.8 for the corresponding week in 1945, with 90.7 for 1944, with 88.0 for 1943, and with 88.4 per cent for the corresponding week in 1942.

Paperboard production for the week ended June 8 was 96.0 per cent of capacity, compared with 85.0 per cent for the preceding week, with 97.0 for the corresponding week in 1945, with 96.0 for 1944, with 92.0 for 1943, and with 72.0 per cent for the corresponding week in 1942.

Wood Pulp

Pulpwood deliveries to the northeast pulp mills are showing substantial gains. A large portion of the total is rough wood and there are still a number of mills without sufficient machine barking capacity who are disturbed by the lack of crews to peel this wood.

Imports of wood pulp are expected to run heavily in unbleached pulps of all kinds although there may be a slight gain in the percentage of bleached compared to last year. It is still a question as to whether 1946 shipments will equal 1945 from Sweden, but total shipments should be as large due to the gains in Finnish deliveries and the possibility that Norwegian shipments, in smaller volume, may arrive by midsummer.

Rags

Market for cotton rags is reported firm. Sales of heavy wipers at $55 per ton have been noted. Classification stock of No. 1s and 2s are reported at $31 and $29 shipping point plus commission of $1 per ton. The usual ratio offered is three truckloads of classification stock to one of heavy wipers.

Inventory position of the mills is reported around 20,000 tons. June inventories are expected to be the highest since 1942 or 1943. While the inventory is concentrated, two mills alone having more than half the total, other mills are not bad off since some of them are large users of wood fibre.

Old Rope and Bagging

Volume of sisal is fairly good with all No. 1 large sisal rope bringing 4.75c per pound. No. 1 Manila remains in short supply at 5.75c. Some imports have been of dubious quality, but most lots were sisal or mixtures of sisal and Manila rope. Shipments to date have not uncovered any Abaca fibre. The situation is the same in sisal strings, jute strings and mixed strings. Demand is good for the first two, poor for mixed strings.

Mills have purchased scrap burlap at $4.37½ per 100 delivered this week despite a number of carloads still to be shipped on old orders at $4.50 and up. In the South, the mixed bagging market ranges from $3.50 to $3.75 f.o.b. point of shipment. Northern dealers have received small lots of scrap bagging at $3.50, but the better packs run from $3.75 to $4.00. There is no oversupply despite the relatively light demand. Current demand for gunny is keen since further shipments from Britain have been sharply cut; with latest sales reported at $4.10 ex-dock.

Waste Paper

All grades of waste paper are steady though mixed and news are relatively easier in supply. Bundled and loose news is plentiful and less easy to dispose of. Some sections report they could use more corrugated despite the backing up of some tonnage in New York where recent strikes temporarily closed two board mills. No. 1 books and magazines, which are currently loaded with pulp magazines, mail order catalogues and similar type papers, are being flatly rejected.

It is voiced in the trade that some of the tonnage which is not moving too readily in this area may find its way into the export market before long. Mixed and news are the grades sought, and various European countries notably France and England are mentioned as the buyers. Export ceilings are under MPR 30 but there are dock, handling, loading and various other charges which are also applicable.

Bristol Issues New Catalog

WATERBURY, Conn. — The Bristol Company has just published a new general catalog, No. W1800, covering the complete line of Bristol Modern Industrial Instruments. There is much information in this new catalog. The title is Specification Index for Bristol automatic controlling, recording, and indicating instruments.

The booklet contains 24 pages of condensed information on instruments and gives hints on how they can be used effectively in industry to save money and time, and promote more efficient operation. In order to make the publication valuable for reference purposes specification data is given on each instrument listed.

CONGRESS OPENS PAPER BIDS

(Continued from page 64)

R. P. Andrews Paper Co. .....
(1,500,000 lbs. on Lots 325, 326 & 327). 6.17c

Whitaker Paper Co. .....
(2,625,000 lbs. on Lots 325, 326 & 327). 6.22c

No. 326—2,000,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter and 33 ins. wide, 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. .....
(1,500,000 lbs. on Lots 325, 326 & 327). 6.17c

Whitaker Paper Co. .....
(2,625,000 lbs. on Lots 325, 326 & 327). 6.22c

No. 327—1,250,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter, 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. .....
(1,500,000 lbs. on Lots 325, 326 & 327). 6.17c

Whitaker Paper Co. .....
(2,625,000 lbs. on Lots 325, 326 & 327). 6.22c

Binder's Board, No. 1 Quality

No. 366—150,000 lbs.; flat, to trim 25x30 ins., No. 16, 18, 20, 25, 30 and 40.

Binder's Board, Best Quality

No. 368—20,000 lbs.; flat, to trim 20x30 ins. and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40, and 45. Min. order, 5,000 lbs.

Consolidated Paper Co. 6.621c

Chestnut Cover Board

No. 369—40,000 lbs.; flat, to trim 25x30 ins., Nos. 17, 19, 21, 25, 31 and 41.

Mead Sales Co. (Thickness .050). .. 4.775c
(Thickness .060 and up). 4.40c

PAPER MAKING MACHINERY

Fourdrinier Paper Machines
Quick changing wire features

Cylinder Paper Machines for all grades of board

Bevel Gear Drive Stands with Ball Bearings and M & W High Speed Friction Clutch

Brass Collapsible Winder Shafts
Non-sticking; quick-changing

"Criss Cross" Shower Pipes
High Efficiency with low water consumption

Millboard Machines
For asbestos gaskets, also cement siding

Drum Winders
Two-Drum type for small rolls
Four-Drum type: electric or belt drive
Two-Drum and Four-Drum Supercalender Winders

High Density Bleaching Process
Wolf, Belmer, Fletcher

Pumps: Stuff; Suction; Centrifugal

Reels
With 2, 3, 5 or 6 drums; Upright and Revolving types

Rotary Screens
Clean paper with minimum maintenance

Save-Alls
Economical, efficient closed system

Single and Duplex Cutters
High speeds—all widths—all kinds of paper

Single and Duplex Lay Boys
Increase cutter output; reduce finishing room costs

Slitter Parts
New ball bearing type, with removable Slitters, saves slitter tears

Wire and Felt Guides
Ball and plain bearing types for all speeds

Wood Suction Box Covers
Saves wear of the fourdrinier wires

M & W Friction Clutches and Speed Changers

INFORMATION AND BULLETINS ON REQUEST

The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

DON'T LET A QUESTION MARK
OVERHANG YOUR FUTURE OPERATIONS...

We lay no claim to being prophets and we possess no crystal ball which foretells the future.

But we can tell you this much right now with certainty — — the industries which survive and reap the golden profits in the post-war era will be those which keep abreast of the times . . . in manufacturing techniques . . . in modernization of plant facilities and equipment . . . in complete preparation for reconversion now . . . and in changing and improving their methods to meet constantly changing conditions in the years to come.

We Offer A Complete Service
In All These Fields

THE McPHERSON COMPANY
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WATER TREATMENT – INDUSTRIAL WIRING – STEAM UTILIZATION – WASTE DISPOSAL – ELECTRIFICATION

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 19, 1946.

BLANC FIXE — Market remains active. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER — Demand reported very active. Supply situation is reported favorable at this date. Quotations are unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 33 cents per pound; 2,000 pounds, 33¼ cents per pound; less than 2,000 pounds, 33¾ cents per pound, f.o.b. shipping point. Imported, 33 cents per pound.

CAUSTIC SODA — Current demand continues very heavy. Production large, but deliveries slow. Market tight. Supply of drums short. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 to $2.95 per 100 pounds.

CHINA CLAY — Demand is reported fair to good. Quotations remain unchanged. Supply short. Domestic filler clay is currently quoted at from $8.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE — Very strong demand in a tight market. Inventories lowered. Quotations unchanged. Chlorine is currently quoted at $2.00 to $2.25 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN — Demand continues steady. "G" gum rosin is quoted at $6.74 per 100 pounds, in barrels, at Savannah; "FF" rosin at $6.70 per 100 pounds, in barrels, at New York; seventy per cent gum rosin size at $6.95 per 100 pounds, f.o.b. works.

SALT CAKE — Reported heavy demand is currently keeping inventories low. Prices remain unchanged. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Over-all demand continues very heavy. Market remains tight with demand above output. Bulk shipments steady. Bagged lots still slow. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.95; in paper bags, $1.05; and in barrels, $1.35.

STARCH — Demand continues to exceed supplies. Market tight. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags; car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand reported active. Supply situation fair. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.35 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.75 to $2.00 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand moderate. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC — Prices on talc continue unchanged. Demand steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $24 to $30 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$67.00	@	—
Sheets	75.00	@	—

* OPA Maximum Price.

Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—

* OPA Manufacturers' Prices.

Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—

Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—

Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—

Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—			
News	*$54.00	@	—
Chip	*54.00	@	—
Sgl. Mla. Lt. Chip	*65.00	@	—
White Pat. Coated	*79.00	@	—
Kraft Liners 50 lb.	*74.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper
Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$15.50
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. C.	8.80 " 10.00
D Grade E. F.	8.25 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers' Prices, Less Freight. Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$94.00
Unbl. Softwood Sulphite	82.00
Bl. Hardwood Sulphite	91.50
Unbl. Hardwood Sulphite	79.50
Bl. Glassine Sulphite	97.00
Unbl. Glassine Sulphite	86.00
N. Bleached Sulphate	94.00
S. Bleached Sulphate	88.00
N. Semi-Bleached Sulphate	89.00
S. Semi-Bleached Sulphate	83.00
N. Unbl. Sulphate	76.00
S. Unbl. Sulphate	69.50
Bl. Soda	84.00
Unbl. Soda	80.00
Groundwood	58.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$12.50
Lake Central	12.50
Southern	15.00
West Coast (in area)	9.50
West Coast (out area)	15.50

	50%-80% Air Dry Weight
Northeast	$10.50
Lake Central	10.50
Southern	13.00
West Coast (in area)	8.50
West Coast (out area)	14.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$7.50
Lake Central	7.50
Southern	10.00
West Coast (in area)	6.50
West Coast (out area)	12.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

IT'S NO SECRET

that in the Southeast there are excellent opportunities for manufacturing and distributing enterprises of almost every kind. The records of companies already located here give ample evidence of that.

But, finding the right location for a specific operation calls for an intimate knowledge of the factors which will make for the success of the enterprise. Your search for the most satisfactory location can be a time and money consuming process.

It need not be, however. Our staff of trained specialists, equipped with knowledge gained through years of experience in helping management to locate plants where they will enjoy the greatest advantages, is ready to assist you. Detailed, up-to-the-minute information on sites recommended by us will be furnished you promptly.

Remember, too, that our services are rendered without obligation on your part and all negotiations are held in strict confidence. Simply address:

Dallas T. Daily
General Industrial Agent
Seaboard Air Line Railway
Norfolk 10, Va.

THROUGH THE HEART OF THE SOUTH

7 REASONS WHY YOU SHOULD USE THE DEUBLIN UNION

A NEW type rotating water joint for cooling or heating revolving shafts, cylinders or drums.

1 NEW PRINCIPLE makes it the most economical and efficient water joint to install and operate.

2 LEAKPROOF—Helical groove cut in rotor and running counter to direction of rotation prevents leakage between housing and shaft.

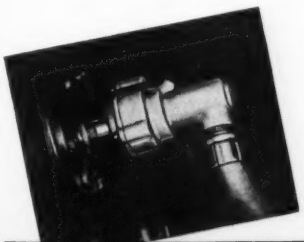
3 CORROSION PROOF—Stainless steel shaft and cast bronze housing resist corrosive action of liquids used for cooling and heating.

4 NO BINDING ACTION—Friction is so slight that the flexible hose connection keeps the housing from turning.

5 TRIPLE STRENGTH—Stainless steel bar stock, from which the rotor is made, has over three times the tensile strength of cast shafts.

6 DOES NOT WOBBLE—Special tooling makes the threads concentric in relation to bearing surfaces.

7 ECONOMICAL—Because Deublin Unions are made with production sturdiness and watchmaker's precision, "down time" on operating equipment due to leaks or repairs is reduced to a new *record breaking* minimum.



WRITE TODAY! Learn more about this new trouble-free water joint.

Typical performance! No water lost, nor signs of wear apparent after over 70 million revolutions on a high speed printing press.

DEPARTMENT B
Deublin Company
NORTHBROOK, ILLINOIS

Old Rags

White, No. 1—			
Repacked	*2.80	@	—
Miscellaneous	*2.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	1.50	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¾	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean Bright—Sisal Strings	.04	"	—
No. 2 Clean Bright—Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings	2.50	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—
Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*	"	4.00
Mixed Rope	1.60	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.85	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—*

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—